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A Practical & Theoretical Treatise

By ...

Alfred Hawkesworth, •

Lecturer on "Sheep and Wool,"
Technical College, Sydney.



Edited by ...

R. N. Morris, LL.D.,

Superintendent of ...

Technical Education, Sydney.



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1900.

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PREFACE.



DURING the past few years a great many sheep-breeders, wool-growers, and others connected with the wool trade, have sought varied information relating to sheep and wool. These, together with many other inquiries, have given me great encouragement to compile a work on "Australian Sheep and Wool." Up to the present time the publications on these subjects are British, Continental, and American, which are either too advanced, or deal with sheep and wool upon a small scale, and, therefore, altogether unsuitable for these colonies, where the industry is on a much larger scale. In writing this work I have not made any attempt to teach our most experienced sheep-breeders or expert wool-buyers, but have sought to make it a source of information to our smaller and struggling pastoralists and graziers, and more especially to the young and future wool-growers and the rising generation of wool-brokers and others. With this object in view, I have written in the plainest and simplest manner possible, so as to be easily understood by all classes, and offer to the public generally a text book on sheep and wool.

My grateful acknowledgments are due to R. N. Morris, Esq., LL.D., Superintendent of Technical Education, for the great interest he has taken in revising this work.

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The fencer, an old hand at the work, considers it the best wire he ever used—and he has been fencing for the last 20 or 30 years—and he seemed surprised that a wire of that guage should stand the strain, especially during the cold weather I speak of.

I would certainly recommend the use of this wire.

This wire takes about 10 cwt. to the mile (6-wire fence).

No. 10 ordinary fencing wire takes 13 cwt.

(Signed) CYRIL BLOOMFIELD,

Manager, Terry Hie Station,

Moree, July 15, 1899.

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PREFACE.—*Continued.*

I wish also to express my deep thanks to Mr. M. F. Connelly, of the Technological Museum, Sydney, for the great trouble he has taken in the re-production of the illustrations; and to Mr. H. G. Smith, F.C.S., Technological Museum, for the analysis of the pure Australian wool.

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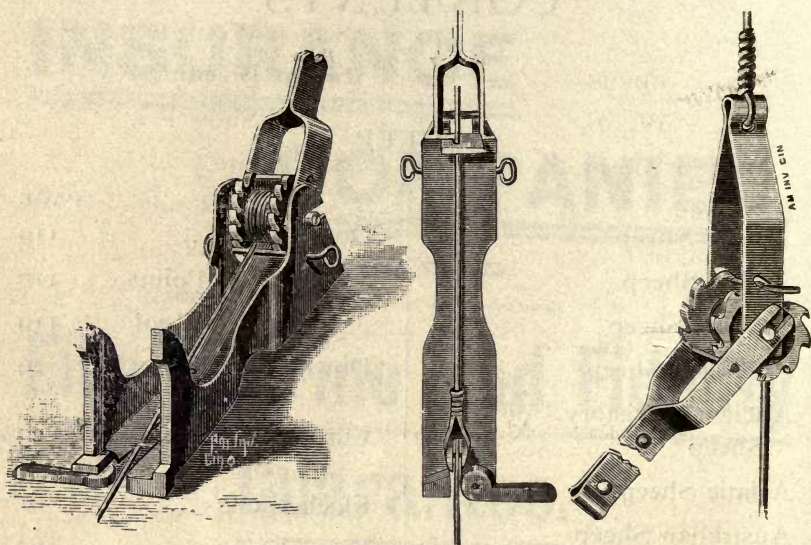
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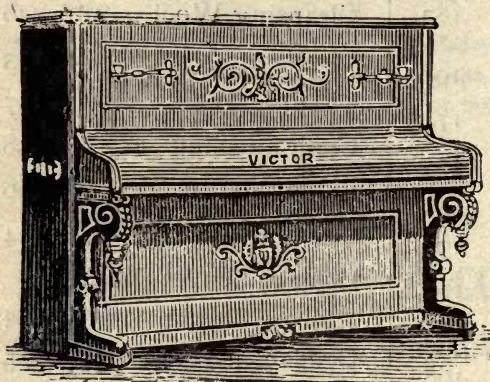
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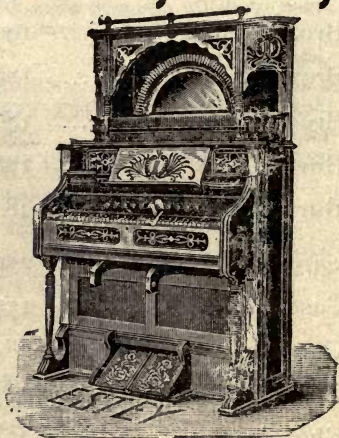
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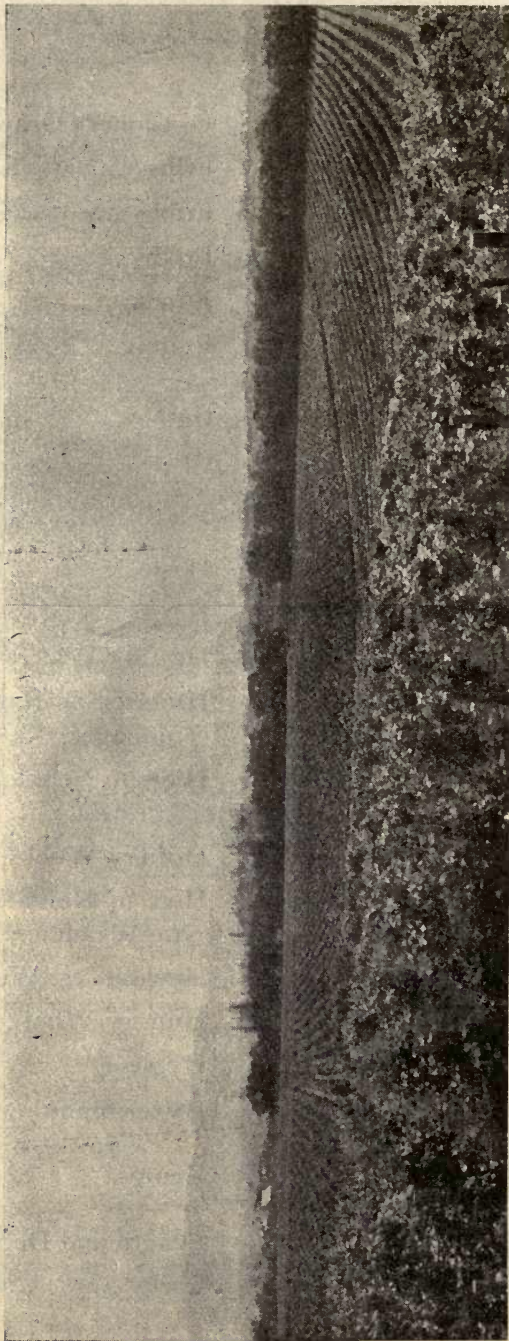


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J. B. MACLAURIN,

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HAVING taken over in its entirety the business of HACKETT AND WEBSTER, lately trading as HACKETT AND MACLAURIN, Shearing Contractors, at 6 Spring Street (*vide* extract *S.M. Herald*, 16th February, 1900, at foot), Pastoralists may rest assured nothing will be wanting on my part to give every satisfaction in the fulfilment of Contracts entered into by me.

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WRITE FOR

TESTIMONIALS.

NOTICE is hereby given that the undersigned EVELYN PRENDERGAST HACKETT and LAUHLAN MACKINNON WEBSTER, heretofore carrying on business as Shearing Contractors under the style of "Hackett and Maclaurin," have this day ASSIGNED all their interest in the Goodwill, Assets, Machinery, and Business to the undersigned JAMES B. MACLAURIN, who will henceforth carry on the same on his own account, and in his own name, at the Office of the late firm, No. 6 Spring Street, Sydney. Dated this thirteenth day of February, 1900. LAUHLAN M. WEBSTER, E. P. HACKETT, J. B. MACLAURIN. Witness to the signatures Evelyn Prendergast Hackett and Lauchlan Mackinnon Webster, MELB. J. MACNAMARA, Solicitor, Sydney; and to signature of J. B. Maclaurin, ROBERT SMITH, Solicitor, Sydney.

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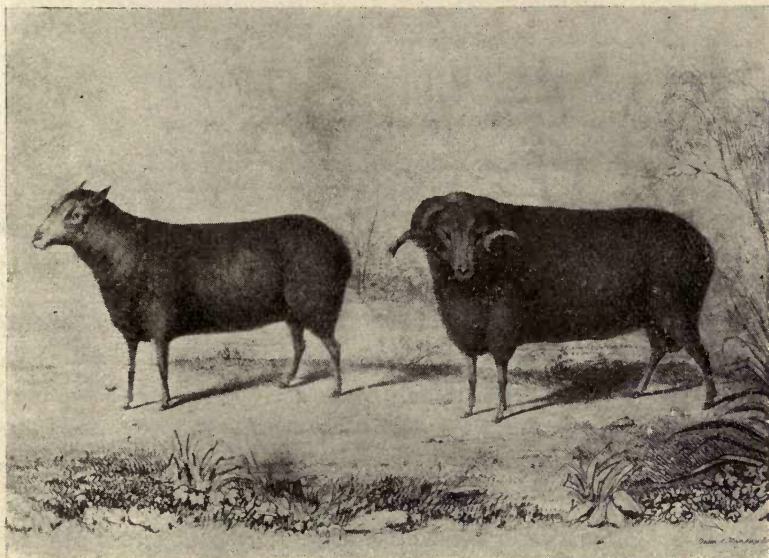
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THE SHEEP.

ZOOLOGICAL CHARACTER.

SHEEP, as to their position in the Animal Kingdom, belong to the ruminating order, or cud-chewers. They have front teeth in the lower jaw only, which are opposed to a tough pad or insensible substance in the upper jaw. There are six molar teeth in the sides of the upper and lower jaws, which are adapted to act as grinders. They have four stomachs, and these, with the gullet, are so constructed that the food is returned for rumination.

In the Capridæ, or goat family, the horns, when they are found, are permanent, and are placed on a vascular, bony foundation. The horn as it grows shows great irregularity, taking the form of ringlets at the base. These irregularities are in the shape of deep indents and ridges around the horn, each denoting a year's growth. The general structure of the Capridæ is light, and generally adapted for fleetness; and they are very sure-footed. The ears usually stand erect, and are funnel-shaped; the pupils of the eye are oblong; the teeth have more of a square tip than a canine or pointed shape.

The Genus *Ovis* is another kind, and may or may not have horns, but when present they take a more or less spiral shape. The outline of the face is convex; there is no respiratory opening under the eye. The nostrils are lengthened, and terminate without a muzzle. It differs from the Capridæ in having no beard. The body is covered with very short hair, with a soft, downy wool underneath, and when in their domesticated state this wool prevails over the hair. The legs are slight, yet strong and firm, but perfectly free from bunches of hair. Of these there are three varieties, viz., *Ovis Ammon*, or *Argali*; the *Ovis Musmon*, or *Musmon*; and the

Ovis Aries, or Domestic Sheep. The latter will receive most of our attention for some time. The *Ovis* and the *Capridæ* resemble each other to a great extent. The differences between them are chiefly these :—Many sheep are without horns, but when present take a spiral or curved form, whilst those of the goat have an upward and backward direction. The forehead of the sheep is convex, or swelling externally in a spherical form, that of the goat being concave, or hollow, without angles. The sheep in its domestic state has nothing resembling a beard ; but the goat is bearded. There is one species of goat, the Cashmere goat, which, when it is thoroughly domesticated and improved, produces a wool finer than any wool grown upon a sheep. This growth is mostly covered with hair, while the hair on the sheep by domestication may be reduced to a few kemps, or can be got rid of altogether. Finally, the pelt, or skin, of the goat is much thicker than that of the sheep.

The names given to sheep are different in various countries. The general name of a male sheep is ram, in some places tup ; while with his mother, a ram lamb, sometimes in England, a hieder or pur-lamb. From the time of his weaning until shorn he is a hogget in this country, whilst in England he is called a hog, hogget, hoggerel, or teg. If castrated, the name is a wether hogget. If a sheep has been shorn as a lamb, then, after the first full fleece is cut off, it is called a shurled hogget. After the first full fleece has been shorn from an unsexed sheep, he is always a wether. Wedder is the name given to a sheep which has grown a full fleece before he is castrated. The female is a ewe lamb, or is sometimes called a gimmer lamb until it is weaned ; afterwards, ewe hogget, hog, teg, or shedder ewe. After shearing she is a ewe or gimmer, while we call her a two-tooth ewe ; afterwards she is named, according to age, four-tooth, six-tooth, eight-tooth, full-mouth, and broken mouth. The age of sheep is not reckoned from the time they are born, but from the first shearing ; they, up to that time, are first lambs, then

weaners, and hoggets. When the sheep show two broad teeth, they are considered to be in their second year, although many begin to show these two teeth when a little over ten months old. What we understand when a sheep has two broad teeth in the centre is that it is over 12 months, but under 24 months, old. When we have any doubt about the age of a sheep, we always look in the mouth, and so determine the age; and this is the only safe way to decide. Many take the horn into consideration, but are likely to be deceived, more especially in the ewes. We will, for instance, take a young ewe which has produced a lamb. Her horns, if any, will always make her appear a year older than she really is, having a ring more than a ewe of the same age which has not had a lamb. It has been said that the sheep has no teeth in the upper jaw, but they have a substitute in the shape of ridges or bars, which thicken as they approach the fore part of the mouth. These ridges are composed of dense, tough, fibrous, elastic matter, which forms a bed or cushion on the extremity of the upper jaws, and stands as a substitute for the cutting teeth. The herbage is firmly held between the front teeth of the lower jaw and this tough bar on the upper jaw, and is partly bitten and partly torn away. The number of teeth is the same in the sheep as in the ox, viz., eight incisor or cutting teeth in the fore part of the lower jaw, and six molars or grinders in the upper and lower jaws on both sides. The cutting teeth are better adapted for the purpose of grazing than those of the ox. The sheep nip much closer than the ox, and can live where the other would starve, and can, in fact, find a good living where the ox could not possibly get a nip or blade of grass. This is one reason why sheep improve any pasture in which they are placed, because by the close biting and partial tearing they cause the roots to become loose, and this tends to make them spread; and by cutting off the loose suckers and sproutings cause the plant to throw out fresh, stronger, and more numerous ones, which both improve and increase the value of the crop. The

formation of the upper lip of the sheep greatly assists in this, it being deeply divided and free from hair about the centre, thus enabling it to get closer to the ground.

TEETH.

The lamb when born is either without incisor teeth, or has only one. The teeth grow very rapidly, and before it is a month old it has eight teeth, which are called **SUCKING TEETH**. They continue to grow with the growth of the lamb until it is sometimes 16 months old. Generally speaking, at the age of 12 months the two central teeth fall out, and are replaced by two larger ones, which continue to grow until the sheep is about 24 months old. From the time it begins to show these two larger centre teeth the sheep is called a **TWO-TOOTH**, and is in its second year. Teeth differ very much in different sexes, health also having much to do with their state and growth, also good or bad, rich or sandy pastures; for, whenever sheep are on bare or gritty soils, their teeth show signs of wear much sooner than those feeding on richer soils. Shortly after 24 months old, and considerably before 36 months, the two teeth next and outside each of the two large centre teeth are shed, and their places taken by two additional large ones, and are fully developed when the sheep is 36 months old, when it is called **FOUR-TOOTH**. When four years old there are six large broad teeth, when the sheep is called a **SIX-TOOTH**. At five years all the sucking teeth are gone or shed, and the mouth is full, when the sheep is called **FULL-MOUTHED**, there being now eight fully-developed teeth. After this there is no certainty as to the age of the sheep, and all are called aged sheep, and begin generally to decline. The age which sheep may attain is difficult to assign. Many will live and thrive up to 10 years old, but they must have had good treatment. Of the molar teeth there is not much to say, but they act as grinders for reducing the food to pulp.

VARIETIES OF SHEEP.

There are a great many different varieties of sheep, which naturally yield a great many types of wool, and can be divided into two great families—the Long and Short Wools. All other grades are but varieties of these two families, the result of crossing, assisted by climate and pasture. These families can be further divided into four groups.

I. EUROPE.

The Spanish Merino, comprising Chunah, Escorial, Estantantes, Transhumantes, and seven other varieties, viz., Merino, Leonese, Negretti, Escorial, Guadaloupe, Paular, Infantado.

The French Merino, named the Rambouillet.

The Saxony Merino.

The Prussian Merino.

The Silesian Merino.

The Hungarian Merino.

The Hanoverian Merino.

The Russian Merino.

The Austrian Merino.

The Swedish Merino.

The Danish Merino.

The Italian Merino.

The British Domestic Sheep, comprising Lincoln, Leicester, Cotswold, North Devon, Yorkshire, Nottingham, Romney Marsh, Border Leicester, Cheviot, Bedford, Gloucester, Derby, Exmore, Hardwick, Pentston, Stafford, Somerset, Worcester, Devon, Ryelands, Hereford, Cornwall, Wensleydale, Dartmoor, Limestone.

The Downs Families—

South Down.

Shropshire.

Hampshire.

Wiltshire.

EUROPE—The Downs Families (*Continued*).

Oxford.

Suffolk.

Sussex.

Norfolk.

Other Breeds—

Welsh Mountain.

The Irish.

Black Face Scotch.

Lonk, Shetland.

The Cretan Sheep.

The Crimean.

II. ASIA.

Hooniah, or Black-faced Sheep of Tibet.

Cajo, or Cabul Sheep.

Nepaul Sheep.

Mysore Sheep.

Indian Sheep.

Deccan Sheep.

Chinese Sheep.

Broad-tailed Sheep.

Hindustan Sheep.

Tartary Sheep.

Barwell Sheep.

Short-tailed of Russia.

III. AFRICA.

Smooth-haired Sheep.

Cape Sheep.

Guinea Sheep.

Zeylan Sheep.

Fezzan Sheep.

Congo Sheep.

Yenu, or Goitered Sheep.

Madagascar Sheep.

Bearded Sheep.

Morocco Sheep.

IV. AMERICA.

American Merino.

Canadian.

West Indian.

South American Merino.

Brazilian Merino.

NAMES GIVEN TO DIFFERENT SHEEP.

The names given to sheep vary in different countries. In these COLONIES, they are, in the Merinos:—

RAM.—A male sheep.

RAM LAMB.—A young unweaned male sheep.

STAG.—A matured ram castrated, known here sometimes as a wedder.

RIGG.—A young male sheep that has not been properly, or only half, castrated.

WETHER.—A castrated male sheep.

WETHER HOGGET.—A castrated male sheep, so called till showing two centre broad teeth.

SHURLED HOGGET.—A young sheep till showing two centre broad teeth, and which has been shorn as a lamb. Relates to either male or female.

EWE.—A female sheep.

STUD EWE.—A pure-bred ewe, kept for breeding stud stock.

FLOCK EWE.—A female sheep of the ordinary or common class, running in large mobs without any special attention.

WET EWE.—A ewe suckling its lamb.

DRY EWE.—A ewe not in lamb.

MAIDEN EWE.—A young ewe not put to a ram.

EWE LAMB.—A young female sucking sheep.

PODDY.—A lamb having lost its mother, and stunted in growth.

ENGLISH AND SCOTTISH NAMES.

MALE.—Ram or tup.

HOG, HOGGET, HOGGEREL.—From the time of weaning to 1st shearing.

SHEARLING—Dinmont tups, or one shear tups. After 1st shearing to 2nd.

TWO-SHEAR RAMS.—From 2nd to 3rd shearing.

THREE „ „ „ 3rd to 4th „

FOUR „ „ „ 4th to 5th „

HE TEG.—A castrated male from the time of weaning to 1st shearing.

SHEAR HOG WETHER. — After 1st shearing to 2nd shearing.

WETHER TEG.—Used mostly in connection with the Down breeds, and is a castrated male sheep to the 1st shearing.

EWE.—A female sheep.

EWE TEG.—A female sheep up to 1st shearing.

GIMMER.—A Scotch name given to a female sheep after the 1st shearing.

BARREN GIMMER.—A ewe sheep not in lamb between 1st and 2nd shearing.

EILD GIMMER.—A female sheep not put to a ram.

YELD Ewe.—A name given to a ewe after she has suckled her lamb.

DRAFT EWE.—An ordinary flock ewe of any age.

CROSSBRED. — The progeny, the result of coupling ; different breeds of sheep.

HALF-BRED. — The descendants of two pure breeds of sheep.

COMEBACK.—The offspring of two pure sheep of different breeds, mated with a sheep of the same breed as one of the parents, will produce a comeback. Take a half-bred Leicester merino ewe, and put her to a merino ram ; the result will be a coming back on to the merino, being three-quarter merino.

and one-quarter Leicester. What is understood as a come-back in these colonies is obtained by using a pure-bred English sheep with a merino, and breeding back on to the merino.

MONGREL.—When a ram of mixed breeds is put to a ewe of mixed breeds, the progeny is called a mongrel. For instance, take a crossbred Lincoln-Romney Marsh ram, and put to a merino-Leicester ewe; the descendant will be a mongrel, or a mixture of many breeds.

CLIMATE AND PASTURAGE. —

The pastoral industry of Australasia up to within the last ten years was a much more profitable investment than at the present time, as rents and taxes were much lighter than in recent years, which, together with the greater value of wool, made the life of a squatter comparatively easy and comfortable. In those years there was little science required, not half the judgment necessary, as one did not need to be so particular as to the type of sheep he should husband. Now, all this has changed, until it behoves all who are embarked in the *profession* — which it now certainly is — to give serious consideration to the varied circumstances required to obtain the best results.

In years gone by, a pastoralist could afford to become the owner of a breed of sheep according to his own fancy. Yes, and make it pay. Now that fancy would spell ruination, which, indeed, it has done in a very great many cases.

To be successful in the growing of wool, the first consideration is to study climate and temperature in that particular district where the pastoralist has cast his lot. In Australasia especially, through its varied climates and temperatures, the first and most important question deserves far greater study than it usually receives, as different types and breeds of sheep will thrive and give satisfactory results where others will degenerate in every possible way, both in

carcass and wool. Take, for instance, the fine-woolled merino sheep, place them on the open, unsheltered Western Plains, and their fleeces will gradually become lighter and lighter, until there is very little left but a thin, delicate fleece, weighing 2, 3, or 4 lbs., of little monetary value, worth, say, from 2s. to 2s. 6d. per fleece, which is not by any means a paying price, especially when this type of sheep leaves a light carcass for the butcher when they arrive at a fattening age. Such is the effect upon fine-woolled sheep on these open, dusty, and sunny plains. On the other hand, place the stronger merino in the district, with its more robust nature and type, and altogether better suited to resist the damaging conditions of that climate, and the difference will be very palpable. We should find large, healthy fleeces, comparatively speaking, uninjured by the hot, dusty, climatic influences, and the weight of wool per sheep would be found, under careful management, to be from 7 to 8 lbs., whilst there would be a good, large, marketable animal left when the wool-producing properties began to fail. Experience within the last few years has taught much. By strict observation, various districts have been proved to be specially favourable to certain breeds. Hence we find many of the old flocks replaced by a different breed of more suitable type. Take, for instance, the celebrated Riverina district, with its open, exposed plains, with little or no shelter from the sun and wind. There are now to be found there the most perfect strong-woolled merino sheep, whilst the finer-woolled sheep get fewer and fewer, and it is even doubtful if there is a truly fine-woolled sheep in the district. Of course, there is the fine Riverina type, but it cannot be classed with the fine-woolled sheep from Tasmania, Mudgee, and New England. To further illustrate the effect climate has on the production of wool, we need only consider the great failure of the Spanish merino sheep when they were introduced into England. The climate did its work most effectually, and, whilst the merino failed, other breeds prospered. Or, again,

consider the sheep in Turkey in Asia, and all in the Don district. There we find the climate tends to change wool into hair of a bright lustrous nature, whilst the hair grown in that part of the world has no equal in any other part, either for the purity of colour or silkiness of its texture. The Angora goat, which provides the celebrated mohair, is found in a state of perfection in those localities, and if moved to other climes gradually degenerates; the wool loses its brilliancy of colour, and softness of texture. Not only does climate affect animals, but also determines the manufacture of many kinds of goods, some districts being better adapted for the production of wool for the making of certain classes of goods than others.

SHEEP-BREEDING.

Sheep, above all other animals, are the most susceptible of improvement, even if only moderate treatment is meted out to them. From time immemorial, when this most useful animal became associated with mankind, there were signs of a marked improvement in the ungainly shaped body, whilst the hairy covering was gradually changed into a kind of soft fibre of improved structure and texture. Ancient history further tells us how, in very early times, improvements were made, even in the colour of the covering of the sheep. We read of the Patriarch Jacob, when a shepherd under Laban, how he brought a change in the colour of the wool of the younger sheep of his flocks, solely by scientific breeding from black to speckled, or a kind of streaky fleece. The story of this changing of wool from the original colour, black, into variegated speckled fleeces may be interesting, and serve as an object lesson to many of the younger members of the pastoral industry, also to others who are inclined to take risks or chances in the management of their flocks. Jacob, in his early youth, was of an industrious disposition, and travelled in pursuit of work. After many long journeys he happened one day to arrive at a well where sheep and cattle

were regularly watered; towards evening a large flock of sheep arrived for watering, in charge of a young woman named Rachael; as the water had to be drawn, Jacob offered his services to draw for the flock. This kind consideration on the part of Jacob was the prelude to future success in life, and was the means of an introduction to Laban, Rachael's father. Jacob soon became Laban's shepherd, and by industry and general perseverance soon became one of the family. Eventually there arose a kindly attachment between Rachael and Jacob, who, in due course, were married. Jacob, after serving Laban fourteen years, was desirous of returning home, but was induced by Laban to stay and superintend his flocks under different terms to the former arrangements; wages were to be paid in sheep, and Jacob was to have all the sheep that were not of one colour. The flock given to Jacob to tend was entirely black, all one colour, and to all appearances Jacob's chances to breed sheep with speckled or mixed wool were small. Jacob, being of an experimenting disposition, and thoroughly practical as well, devised plans, and tried scientific sheep-breeding, and was successful to such an extent that Laban was alarmed. This was done by making white streaks on the fences of the yards and watering-troughs, where all the sheep were folded together, rams and ewes. These folds are where the coupling mostly takes place, and as the sheep were mating, the strange, streaky appearance of the troughs and fences that they were impressed with the novel sight, and when the lambs were born they had a streaky or speckled wool. By this scientific move Jacob changed the colour of the offsprings of Laban's original flock, which colour, by agreement, became the property of Jacob. It is quite evident that Laban soon found out that there was a great danger of losing his sheep, so he willingly allowed Jacob to depart to his relatives, now possessing large flocks of sheep. It is recorded that a flock had been changed from dark to white by placing flocks, when in season, in yards where there was a superabundance of white. Jacob's

experience serves as a great object lesson, and if sheep in those early days could be improved to such an extent, surely it is not too much to say that, with all the experiments going on at the present day, the breeders have a much easier task than in the olden days. Even in the wool-growing history of these colonies there is a good example set by the earlier settlers, who had everything against them; they were then only at the experimenting stage.

If our pastoralists would only half follow their example, there would be very few inferior flocks in the colonies. The pioneers had to take what sheep they could get from the few ships calling at the ports, but with them they made a noble start. Considering the great distance from Europe, and the means of communication, the rapid advance is all the more startling. It is a little above a century ago when sheep were unknown in this continent. The first importations were of such inferior types as to give one the idea that they were totally incapable of any improvement. They were thin, narrow, long-legged, flat-sided, razor-backed sheep, with covering more like hair than wool, samples of which may be seen in the Technological Museum, Sydney. This was the miserable foundation on which to build such a gigantic industry, which was only brought about by patience, perseverance, and good judgment, greatly assisted by natural causes through climate and pasture. No one can gainsay that the climate and pastures of these colonies have no equal in any part of the world, and it may be safely said that Australia was made for the sheep, and sheep for Australia. There is no climate and pasturage which render such encouragement to sheep and wool cultivation, and it is hoped that still greater advantage will be taken of these gifts of Nature, which are especially helpful to those who are struggling for a footing. Such object lessons as the foregoing should serve to encourage the pastoralists of to-day, who will find it much easier to improve their flocks than was

the case in the days of the early settlers. There is nothing required in connection with sheep-breeding and wool-growing that cannot be purchased according to a man's means. He can buy without going through the experimental stages, making a start where many have been ruined. With careful and judicious selection it is surprising how soon a flock of inferior sheep can be bred to a good standard for wool and mutton, which are really the main features to be considered. To be successful in a general way it is not necessary to aim at the highest class of sheep, but cultivate a useful and serviceable lot, large-framed and well covered with wool. No flock will pay to grow wool alone, but size of carcass must be cultivated also, and the two must necessarily go hand in hand, so that when the wool-producing properties begin to fail and to give unsatisfactory results, there will be something to sell to the butcher. It is acknowledged that there are three different types of merinos, fine, medium, and strong, and each of these is adapted to a particular climate and pasture, and will give the best results when properly placed in this respect.

Fine merinos are best adapted to country of a basaltic formation, and are mostly met with in the Eastern Division of this colony, where fine, short grasses and herbage grow. These important features, together with a generally dry, bracing air, make the surroundings what might be called an ideal home for the fine wools. The medium merinos, which constitute the major portion of our flocks, require a richer country, where the feed is more copious and of a stronger nature and the climate temperate. Being a larger-bodied and more robust sheep than the fine, it naturally requires more abundant feed to keep up the body and covering.

The strong merino is more at home on the open, exposed, dusty, and unsheltered plains country, especially in the Western District of this colony, and this applies also

to similar country in the colonies, Queensland, South Australia, and Westralia. This sheep should be larger, stronger, more masculine in frame, bone, and covering.

The robustness of its wool (being so constituted as to resist the hot, dusty country), together with its aptitude to feed on coarser grasses and herbage, makes the strong merino by far the best sheep for those conditions. Always avoid a small merino sheep with strong wool, as this type is unnatural, and by using it the size of the body in the offspring is liable to be reduced. English breeds, and even crossbreds, have their proper places.

The Lincoln, Leicester, and Cotswold require heavy, rich, agricultural land, with plenty of feed and water. The Romney Marsh or Kent sheep, above all other breeds, are best suited to any swampy or low-lying country, as they resist footrot and fluke to a greater extent than any other breed, and will be a success under such conditions when other breeds fail. The English middle breeds require good, well-drained agricultural pastures, being gross heavy feeders.

The different Downs families, of all English breeds, stand the most hardships in a dry country, and come next to the merino for travelling. In adverse seasons they will stand a pinch, and will not be affected so seriously as the heavier English breeds. These useful sheep, under liberal feeding, give the best results, as early maturers, even in a temperate climate and fair average country, as mostly found in the Eastern Division of this colony. There is not so much risk in sheep-breeding and wool-growing as formerly, thanks to the great object lessons practically illustrated by many of the more wealthy owners and capable managers of the present day. These practical pastoralists, by their experience, have, by frequent changes of the merino type, found what is best suited to particular pastures and climates. This is fortunate for those who are not amongst the wealthy class, also for those who are only embarking in the sheep and wool

growing industry. These have only to copy the most successful experimenters. This cheap information, which to a beginner is everything, enables him at the outset to see what sheep are best adapted to his conditions as regards pasture and climate, and pasture must take first place. Seeing that climate and pasture form the backbone of the pastoral industry, it is admitted that for growing commercial wool, or wool of the ordinary flock, it is necessary to keep to one type, that which gives the best results in wool and size of sheep, and not try, as many have done, to keep pace with fashion, which is very fickle and continually changing.

How often have flocks and owners been ruined by introducing fresh strains or types quite unsuitable for the purpose. After a time, but when too late, the owners find out that the original type is destroyed, the crossing has not nicked, as it is called, and the result is a miserable failure. By the time a flock has been crossed to produce a wool suitable for the fashion, that fashion has changed, and another comes in. A few years ago the rage was for crossbreds, and scores of station-holders went madly into the change, and, not knowing the breeds, bought any kind of sheep called coarse-woolled, resulting in complete failure, producing a mongrel wool as well as mutton. Many have tried to follow fashion in the merinos, with the same result. Finding the right type, keeping to it, and cultivating it thoroughly, is far better than changing and shifting about. Every district has its type, and with careful culling and classing, however faulty a flock may be, it can be vastly improved, both in covering and formation. There is a great tendency amongst many sheep-breeders to give the greatest consideration to the rams, evidently believing, for want of better judgment or knowledge, that to have good or fair rams means the high road to success. How often do we see breeders at our annual stud sheep sales purchasing any and almost all the different strains of merino rams to use in their

flocks? One cannot conceive the idea that he is going to preserve his type by using so many different breeds or strains. It would be most interesting information if we could only get to know the results of 50 per cent. of the rams bought in Sydney during the yearly sheep sales. It is more than probable that the information would show most unsatisfactory results; the only satisfaction to many a pastoralist would be in the knowledge that he was the possessor or owner of a well-bred, expensive ram. The first duty and principal object for a breeder is to become the possessor of suitable ewes, for without them all the high and best bred rams could not reasonably be expected to give the best results. A high-priced ram, however good, must have ewes equally well-bred, of symmetrical formation and proportionately uniform covering. A stud master will consider his ewes first, and he will then select his ram with the view of improving the progeny in either symmetry or covering, or both.

How many of these high-class rams have not had a possible chance to show their worth, simply because the ewes to which they were put were inferior in all-round qualities; blood will tell its own tale; any inferiority on either side of the parents will detract from excellencies of the other. Having an increasing number of small station-holders possessing a few hundred of ewes, which are acclimatised and suited to a district, the nucleus of very useful flocks can be formed by carefully selecting the largest and best formed ewes. They may not be everything desired in their wool-yielding properties, but, having a good frame, there is something to work upon, only requiring an ordinary amount of care and judgment. Having laid the foundation of a flock, through the medium of the best ewes, it is not necessary to secure high-priced rams at this stage. Such a proceeding might not be warranted as yet, the ewes probably not being up to a very high standard. In such cases, select from fairly well-selected flock-rams those best

suited, with the view of improving any faults in the ewes, more especially as to constitution and symmetry. Without unnecessarily going to much expense for a single ram, a few quite suitable and better adapted for building up purposes could be purchased for the same money. By these means the progeny would be gradually worked up to a higher standard, while, at suitable ages, a further selection of the best can be made from the younger ewes. Thus, every season brings an improved flock, whilst the rank and file can go on in the usual way, the object being to keep the flocks within reasonable dimensions, and obtain as much wool as possible. In selecting a ram for use in the better flocks, which would now have an even appearance, or a more uniform type, care should be taken to choose an animal of good constitution, symmetrical, and well covered with ram's wool of a vigorous growth of its type. Let the ram have a merino type of wool, avoiding any of the straight-fibred class. This formation is distinctly opposed to the true merino wool, which is known above all other breeds for its distinct *character*, or, as it was formerly called, "curliness." If the intention is to cultivate a merino sheep, let the covering be a merino wool, whether it is fine, medium, or strong.

The progeny of this better flock should now be of a higher standard than the parents, having a good shape, covered with good, well-bred wool, and more of it. In all probability a few of the extra good ewes might be chosen to form a small stud flock, when a higher class ram will be required, the offspring of which could be used in the ordinary flock, when of age. To ensure a good lambing; the ewes should not be too fat, but in good stock condition, while the males should be on the lusty side. When coupling time arrives, keep the rams and ewes together from a week to two weeks, then take the ram out for a spell and give him good nourishing feed, and at the expiration of 21 days he should go into service again. Any ewes having been in season and missed the ram, in 21 days will come in season again and

take him (the ram). The fact that ewes keep in season from 24 to 36 hours only, accounts for the number of dry ewes, or those which have missed the ram, more especially on large stations. In order to minimise as much as possible what may be considered a loss by having a small percentage of lambs, it will be plainly seen that it is essential that the rams and ewes should have chance of being brought together a second time. In the Western, and part of the Central Divisions of this colony, and also in Queensland, the whole of South and Western Australia, where the sheep are in large paddocks, 3 per cent. of rams are requisite. In the eastern and eastern part of the Central Division, the whole of Victoria and Tasmania, where the paddocks and flocks are smaller, 2 per cent. of rams should ensure a satisfactory percentage of lambs.

You often hear woolgrowers, when discussing the merits of their respective sheep, say : "Well, I have been striving for many years to get my wool up to its present high quality, but now what is my best move to keep it there?" Certainly, there are a good many of our flocks whose wool is as near perfection as wool can be ; it has length, colour, high quality, and body, all that a grower and manufacturer can desire. This, for the pastoralist, is an anxious time, when he asks himself "What is the best thing to do to retain my quality and quantity?" When a wool is of this high quality it is a sign that the sires used have done their duty, all that was expected of them, and that there is new blood necessary to keep up both the quantity and quality of wool. To select sires equally fine would not be as safe as to use the old ones, and both, if used, would have a great tendency to make the wool finer or more delicate, whilst the weight would deteriorate, or, in other words, would lose in substance and body. A renewal of blood is most necessary under these conditions, where a judicious selection would give a further improvement in the progeny. On the other hand, pretty woolled, or rough, uncouth woolled rams would

undo all the labour of previous years. Having, say, a high class of fine merinos, full of quality, it is not the aim to make it finer, but retain the high character and add density. To accomplish this desirable end, make a selection of sires of a suitable strain, being most particular in density of covering, the wool crowded together all over, free in its growth, not too long; look more to the body of the wool than to the length, thereby ensuring substance in the fleece. The next consideration is the style and type of the wool of sires under notice to be introduced into the flock. Avoid a fine wool as mentioned, and select something more robust or vigorous. For instance, if the ewes under notice have a high-class merino wool, then the rams safest to select to retain the quality of the wool should be of a robust and vigorous fine merino type. Rams selected with wools of this description, always assuming that they have good constitutions, and are well formed, will keep up the weight of the wool, and the quality is assured; the robustness introduced will prevent the type becoming finer, if as fine, as the female parent.

✓ **MERINOS.**—At the present time it will be safe to say that there is no breed of sheep numerically as large as the merino. The origin of this breed is not by any means certain, but of this we are assured, that it first came into special notice in Spain. Even as to how its name of merino is derived there is a query. Greek and Roman history tells us of the early domesticated flocks in all the countries on both sides of the Mediterranean. The Phœnicians particularly carried on an extensive trade in wool 1000 years B.C., and were also well versed in the art of making from wool the most costly cloths, dyeing them a rich purple colour. It is conjectured that the Phœnicians purchased their finer wools from Spain. During the Roman Empire, sheep-breeding was an extensive industry, and a large trade was carried on in sheep and wool with the countries of Southern Europe and Northern Africa. Virgil especially mentions in his

writings the breeding of sheep, and offers advice as regards culling, and says :—

Is wool thy care? Let not thy cattle go
Where bushes are, where burrs and thistles grow,
Nor in too rank a pasture let them feed.
Then of the purest white select thy breed.
Ev'n then a snowy ram thou shalt behold,
Prefer him not in haste for husband to thy fold,
But search his mouth, and if a swarthy tongue
Is underneath his humid palate hung,
Reject him, lest he darken all thy flock,
And substitute another from thy stock.

Many ancient historians speak of the colour of the sheep as dark or black, but preference is always given to white. It is now said that there is a possibility that the name of black was given to the wool which had not been washed, or in its greasy state. But, according to the earliest history, Jacob settled that question by changing the colour of the inside of his folds and watering-troughs, making them streaky by the use of white, so as to attract the attention of the sheep whilst coupling. This method of scientific breeding, which had the desired effect, changed the wool of the lambs from its ordinary colour into streaky.

The finest-woolled flocks were found in Pollentia, in Italy, and Corduba, in Spain, on the Guadalquiver.

With reference to the different colours of wool, Cotumella says :—"There are wools of divers colours which may be recommended."

Pollentia, in Italy, produces grey and black ; Corduba, in Spain, and some parts of Asia, wool of a reddish colour.

The great probabilities are that the various colours of wool in different countries are caused by the colour of the soils.

Whether the opinions of many authorities, who have traced the sheep from Colchis through Asia Minor, Greece to Italy, and Carthage, on the north coast of Africa, and, lastly, to Spain, are correct in stating that these sheep were the ancestors of the merino sheep, will probably never be known.

It is positively stated that in ancient times the existence of sheep was confined to Europe, Asia, and Africa. In America there was found a mountain sheep, which probably found its way from Asia. In Australia no sheep of any kind were found, evidently accounted for by its being an island, and a great distance away from other continents.

As the development of the merino is handed down from the ancients we must, therefore, take it for granted that in the Roman era there was a race of sheep found in the countries around the Mediterranean Sea having a wool similarly formed to that of the merino. There appears to be a doubt as to whether these sheep were the ancestors of the Spanish merino, or whether they were imported from that country by the Moors. We are informed that when the Moors were in Spain there was a breed of sheep besides the merino, with a black wool. How the merino derived that name it is a matter of conjecture. Some say that the name merino was given in honour of a Roman officer called "Marinas," who came with sheep to Spain. Another version—Marinas, meaning mariner, from over the sea. Others consider that it took its name from the horned merino found in Morocco, signifying curled, after the character of its wool and horns. As to the modern origin of the name, it will suffice to say that it is taken from the Spanish, the word merino signifying traveller, fugitive, or a travelling sheep. The Spanish phrase, *transhumantes merino*, is in accordance with the custom centuries ago of travelling to the mountains in summer and return in winter time. At that time certain favoured owners claimed the rights to travel and pasture their vast flocks (called "Cabanos") over large tracts of country. This privilege, called "Meza," was claimed to be only the rights of the Crown, aristocracy, and a few convents. Such travelling sheep were given the name of *Transhumantes* to distinguish them from the *Estantes*, so called because they were constantly kept on the same pasture, and did not possess the right of "Meza." The difference existing between the

named flocks is probably due to the above-named system of management, although they may have all sprung from one race. Until about four centuries ago Spain was the sole possessor of this particular race, the wool of which, on account of its peculiar qualities and fineness, produced more durable fabrics than the wool of any other breed. The Spanish authorities soon became aware of the very great advantage they possessed over other countries, and, by law, prevented for a considerable time other countries from becoming competitors, and refused to part with any of this remarkable breed. The English became aware of the superiority of the Spanish wool over their own for manufacturing purposes, and entered into negotiations with the view of procuring some of the Spanish merino sheep, so as to cultivate and raise this fine wool for their own fabrics. It is first mentioned that in the reign of Edward V. 3,000 merinos were obtained from Spain and imported into England, and about 100 years later Queen Mary of England, wife of Philip II. of Spain, again imported 3,000 more merinos, which were distributed over the country to cross with the native English sheep. The result was not a lasting success; the climate evidently was all against the merino race. In the years 1787 and 1791 George III. acquired several rams and 36 ewes of the Negretti breed, being a present from the Marchioness del Campe di Angeto. This flock was kept at Kew, and it is of special interest to Australians that at the first auction in 1804 at Kew numbers were bought by Captain MacArthur, of N.S.W. This is said to be the first real stud flock established in Australia. At the auction 45 rams were sold, and the highest price was £44. After several years other merinos were imported into England and located at Kew, amongst the more noteworthy being a present of 2,000 from the King of Spain (1808), and from the Cabana Paula, one of the finest flocks in the country, belonging to the Carthusian Monastery at Seierka. In 1811 a merino society was formed in England, with "Sir Joseph Banks" as president, for the purpose of

encouraging the breeding of merino sheep. The raising of the merino was only a passing success, and never extended much in England; consideration had to be given to mutton production as well as wool. The last flock was disposed of a few years ago, and was owned by Mr. Sturgeon. Far better results have been obtained from the importations of Spanish sheep into Germany, Austria, and France. In 1765 King Charles of Spain made a present of 92 rams and 198 ewes to Elector Frederick August of Saxony, which were kept on the estate of Stolpen. The Government of Saxony soon found out the utility of these animals, and made a purchase of 89 rams and 169 ewes in 1779, for the sum of £1,500. This flock was also located at Stolpen, and the former was transferred to Lohmen, where it is kept to this day in its purest state for breeding purposes. From these two flocks the merino spread rapidly over the whole of Germany. In Prussia the Government liberally aided the importation of Spanish merinos. Frederick the Great imported, in 1778, 100 rams and 200 ewes, and several years after 1,000 more were selected by Mr. Fink at Petersburg, near Halle.

The excellence of quality and texture of their flocks soon became known, and the breeders, working in conjunction with the manufacturers, forming themselves into a council, did much to further the cultivation of these valuable animals. In 1775 Maria Theresa acquired a flock from Spain. Then followed the Emperor Joseph in 1784 with another flock of 1,000 Spanish merinos, also in 1802 a large flock of 8,000 were imported. The Negretti is another distinct breed of merino, differing from the Spanish merino in body and covering, and known by their thick-set and powerful barrel-like forms, as compared with the Spanish. It has also a more robust wool, and still retains the merino clothing character, and derives its name from Count Negretti, who bred this particular type of sheep.

The third group is the combing wool merino, a flock belonging to the French Government, known as the

Rambouillet. This type of merino was bred with the view of growing a large, powerful frame for the butcher, covered with a lengthy, dense staple, the curves not so numerous, and more wavy or undulating. France being a close neighbour to Spain, the merinos were imported much earlier than in other countries. Mons. Colbert, in the time of Louis XIV., had founded a flock at Rousillon, the descendants of which were used for improving the native races. There was no real success in the native sheep until the introduction of the Spanish sheep to the Rambouillet, through the permission of the King of Spain. These two types, with careful breeding, produced a perfectly new race, having no resemblance to any of its parents, but fully their equal, both in body and in the quality of wool, which now formed the characteristic and fashionable Rambouillet race.

About the end of the last century the Spanish merinos were introduced into younger countries, America and Australia, where they have been successfully cultivated, so that it may be safely said that in no other countries has sheep-breeding been so successful. America began in 1793 by an importation of merinos direct from Spain, through Mr. Foster, of Boston. In 1802 the American Ambassador in Spain procured 21 rams and 70 ewes, and by his successor in 1809 1,760 merinos were sent to America, closely followed by another flock of 3,850. In succeeding years the American stud-masters visited Germany and France, where they purchased extensively. Those from the last-named country were domiciled mostly in California. There are several types of merinos in the States, the best known being the Vermont merino, which were bred from sheep imported directly from Spain by Messrs. Foster, Jarvis, and Colonel Humphrey. These sheep take much after the Negretti type, with big folds and wrinkles, their wool being dense, carrying a great amount of yolk, generally of a dark colour.

Merinos were taken to South America, where they extended and increased rapidly up to within the last ten years,

when the Argentine and Uruguay Republics turned their attention more to crossbreds, leaving the honour to Australasia of possessing the largest number of merino sheep.

The introduction of merinos into Cape Colony is of particular interest to Australia, as from thence came the first imported stock. It is said that the Dutch first brought a few sheep from Spain to the Cape in 1754, but the trial was attended with poor results. About the year 1790 a Mr. Ritter established a small flock at the Cape with fair success, and later on the Dutch Government imported merinos direct from Spain, as well as a few from Kew, England. The importations by Mr. Ritter came into the possession of Colonel Gordon. After the Colonel's death in 1797, the little flock, 27 sheep in all, was sold to Captain Waterhouse and Mr. Kent, Sydney, which were brought out by the ships "Argo" and "Golden Fleece."

At the Cape the merino sheep have been increasing largely in numbers, yielding a great supply of wool, which was of a fairly fine class, but, through neglect or want of knowledge, many flocks have degenerated, their wool becoming uneven and irregular. Although Australasia is a greater distance from the original merino breeding centre, entailing much more risk and monetary outlay, there is no country where the merino has given such satisfactory results, either in quantity or quality of their wool or largeness of frame. The climatic conditions, although varied, with the natural food, have given a helping hand in improving both the body and covering, without the expense of coddling, nursing, and artificial feeding. There is no country where the merino requires less nursing and attention than our own. Nature being so bountiful that these noble animals thrive when turned out into large paddocks, sometimes mustered but two or three times a year, and exposed to all atmospheric changes; yet at shearing time they will yield a large fleece, of the greatest commercial value. The Australian merino wool has no successful competitor; for its manufacturing

qualities, its silky texture, softness, pliability, and colour stand unequalled for spinning and general purposes, whether it be in the fine, medium, or strong classes or types.

The early history of the wool industry in these colonies is full of romance. The early settlers, who had nothing to guide them but their dogged, persistent perseverance, gradually overcame all obstacles, and laid a safe foundation upon which is being built a great nation. In 1793 Captain Waterhouse sold to six different colonists 26 sheep, imported from the Cape to Sydney, Captain McArthur purchasing three rams and five ewes. The Captain appears to have been the most successful of all the purchasers of first importations, and to him must be given the honour of founding, at Parramatta, the first sheep station in Australasia. However, the moist climate and the local pastures had an unfavourable influence upon these sheep. It was not until the pastures had been considerably cleared of timber, thus allowing the sun free access, that the land became purified, and the sourness destroyed, which had greatly hindered the success of sheep-breeding.

Captain McArthur in 1827 removed his flock to Camden, where it showed further signs of greater improvement, and to this day a few descendants remain.

The wool of the present time is lengthy, well-grown combing, full of character and quality, with the real pure merino characteristics, for which these sheep were renowned. In 1804 McArthur purchased a few rams and ewes at George III.'s Kew sales, which arrived in Sydney in 1805. From the blending of these two flocks came the noted Camden flock, which has been kept pure to this day. From time to time these colonies have introduced different types of merino, such as Silesian, Saxon, Negretti, and Rambouillet, to further improve our flocks, until an acknowledged Australian merino was established, for which it can be claimed that it has no compeer in any part of the world for

size of body, together with the quantity, quality, and texture of its wool. The arrival at this exalted position was mainly through the able assistance rendered by the Tasmanian studmasters, to whom much honour is due, and to that colony may rightly be given the name of "The Australasian Merino Stud Farm."

In the early years of the present century the Van Dieman's Land Co. entered extensively into the pastoral industry of the little island, with the object of supplying England with wool, so as to make her as independent as possible of foreign supplies. A large tract of country was secured at Circular Head, and thither large consignments were made from the best and purest Saxony flocks. From 1825 to 1830 that company expended £30,000 in the importation of sheep. The first consignment, through the agency of Mr. W. E. Cur, arrived in 1826, consisting of 10 rams and 40 ewes, of pure Cotswold. In 1827 the "Caroline" landed 103 rams and 61 ewes, at a cost of £14 19s. per head, of pure Saxony merinos. The year after, 13 rams and 359 ewes of the same breed, costing £15 12s. 9d. per head, arrived in the "Timandra." The "Lady Ravenna" closely followed, from the same place, with 14 rams and 291 ewes, at a cost of £15 6s. 10d. per head. In the year 1830 there were in the possession of the company at the Circular Head estates 60,129 sheep, including lambs.

Mr. W. Warrington in 1829 imported 45 rams and 100 ewes of the Electoral breed, from Saxony, as well as pure Negrettis, costing £16 18s. per head. This latter flock was kept separate, and is known as Trimmer's flock. The foundation of the Tasmanian flock was laid with the purest merino types procurable. As time advanced so did the flocks improve, eclipsing in every minute detail the imported sheep. We have only to look back at the great records of high prices paid for stud sheep during the last decade, not only for their beautiful wool, but for their constitution and size, to see that by scientific breeding, sound judgment, carefulness,

assisted by the climate, the Tasmanians have surpassed the breeders of all other countries, producing from the imported stock an all-round improved merino sheep. It is a question whether any other country can at the present time count as many high-class merino sheep as the breeders of Tasmania. The Tasmanians have played a very strong part amongst the flocks throughout Australia, and through them principally the great reputation of the Australian merino wool exists. Their sheep were bred from stock similar to our own, but with more satisfactory results, the climate being the same throughout the island, the flocks much smaller, and the stations cut up into convenient-sized paddocks, thus enabling the studmasters to pay more attention to their charges. As with the American sheep, they have given satisfactory as well as disappointing results, but any disappointment rests entirely with the pastoralists on this continent, many having purchased a good ram or rams without considering the class of ewes they intend them for, whilst the climate in many instances has not received due consideration. How pastoralists situated out West, or on exposed plains, can expect to succeed with the highly-bred Tasmanian sheep, bred and reared under altogether opposite conditions, is hard to understand; it looks far more feasible to breed the stock in localities as nearly as possible like the place where the sheep are bred, then transfer the offspring to back country, or, in other words, acclimatise them gradually. There has been a tendency, even among some of the Tasmanian breeders, to follow the fashion and go in for a much stronger-woolled sheep, and they no doubt have bred some wonderfully good sheep, especially of the medium wool class, a very serviceable sheep indeed. In isolated cases some of the rams sold here in Sydney are too rough in their coats, causing a little disappointment to the purchasers. It is advisable, even in Tasmania, if a strong merino is to be cultivated, to let it have the characteristics of the merino wool. However, the above-mentioned cases are not the rule, but the exception.

The Victorian merino is an excellent animal, mostly descended from Tasmanian stock, the climate tending to encourage an improved length, imparting also an unrivalled, silky texture of the greatest value. The stud sheep are in the front ranks, their large, well-proportioned bodies, together with their high-class wool and density, having placed them in a prominent position amongst Australasian flocks.

The commercial wool of Victoria generally leads all other wools as to value per lb. ; the excellent brightness, together with its beautiful texture, always enhances its value as a manufacturing wool, realising the highest rates, which are readily paid by makers of the best class of textile fabrics.

South Australian merinos as a body differ from those of other colonies, the sheep being large-framed, and carrying strong, shafty, deep-grown wool. There are many admirable stud flocks, and their fine frames and robust wool are favourably known in all these colonies. These sheep are very hardy, and stand the western climate exceedingly well, and the wool, with its vigour, suffers less on the open plains than any other breed.

Queensland has a variety of merinos suitable for the varied climates, from tropical to temperate. On the Darling Downs, which may be called the stud farm for the extensive back country, there are several excellent and highly-bred studs. Amongst them can be found sheep fit to compete in the shows of the more southern colonies, in either the fine, or strong classes. The different studs of Tasmania, N.S.W., Victoria, and South Australia have been extensively drawn from, and many of the best stud sheep of Australasia have found their way into the hands of capable studmasters of the northern colony.

When the Australian merino wool was at its height of perfection and renown throughout the manufacturing world, both for its great spinning capacity, silkiness, softness, and colour, many pastoralists sought to introduce more density,

or heavier fleece, and although very many were obtaining satisfactory weights per fleece and keeping up the high standard of quality, others introduced the American to obtain that desirable end. Much can be said for and against these sheep, as pure as our own, being descendants of the Spanish merino, but from the different methods of treatment, were changed into a special type, very wrinkley, with a great abundance of yolk. There have been many excellent results, and if the texture of the wool has suffered a little, the weight has increased. On the other hand, there have been a great many failures, no doubt caused through ignorance, a want of knowledge of proper selection of ewes to put with American rams. These sheep became so fashionable that a great number of sheep-owners, without considering whether their flocks or climate were suitable for the introduction of the American breed or not, followed the fashion, with a result that spelled failure. At many of our pastoral shows are to be seen sheep penned with the American brand, real good types of merino sheep, covered with a characteristic merino wool, and in the next pen there will be the American Australian sheep, to the wool of which when shorn neither woolgrower nor manufacturer would give the name of merino wool. At the present time there never were in these colonies so many pure merino sheep, giving what has been named by the highest buying authorities a crossbred wool, the results of miscellaneous breeding, and, to use a sheep-station phrase, have not nicked. This is thoroughly illustrated by the result of the Ninth Murrumbidgee Scouring Test, when two of the best known wool-buying experts in Australia, who valued the wool scoured exhibits, reported as follows:—

“The undersigned wish to draw attention to the fact that two of the lots submitted them are distinctly of a crossbred character, not only as regards quality of fibre, but also as regards hardness and absence of true spinning qualities. It would be regrettable if any confusion as to the true quality of the merino fibre was to become prevalent

among breeders, as it would tend to militate against the proper classing and get-up of clips for the market." Signed, Messrs. LEAROYD and PRENAT.

A judicious selection of American rams (but let them have a merino fleece) used with ewes with wool of quality and length, will, in many instances, be beneficial to density. After one strain, in most cases, the safest procedure is to come back on to the Australian merino type to secure an undoubted merino wool.

—A GOOD STUD SHEEP.—Amongst the great numbers of different breeds of sheep, there are many general points that relate to all breeds alike. When selecting the breeding stock of any particular breed there is a standard of excellence which all stud sires and dames should possess in proportion to their type, whether it be the fine merino, or the strong, lengthy, lustrous Lincolns. However careful a breeder may be, he will not produce a strictly uniform excellence throughout his flock, no two sheep being exactly alike; one might have all the good properties of the sire and dam, whilst the same parents will produce another animal altogether inferior in general character.

In the first place the sire must show a prominent masculinity or manliness, whilst the dam should have a more refined build, or effeminacy without delicacy. Both should bear the model and characteristics of the type they represent in a most pronounced manner. The possessing of this family type is considered to be a sign of good blood, the stronger the resemblance the higher class is the breeding or blood. A sire should give at once the impression that he is manly, noble, and commanding, with a forcible expression, a leader and guardian of his flock. To assist himself in this position he must have a sound constitution and great vitality; possessing these requisites, he is considered to be the qualified leader and head of a flock. When choosing, look at the head, which should be well set, not too large or small, but in keeping, or in proportion, with the body; face open,





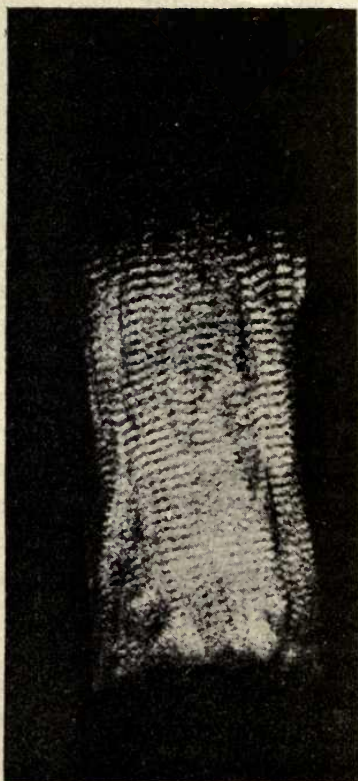
MERINO STUD RAM.

with a determined expression ; eyes prominent, bright, but kind and intelligent ; the neck well rounded, muscular, wide at the junction of the head, and enlarging gradually until joining the shoulders. There should be a wide, deep, and roomy chest, full and wide around the girth, straight from the base of the neck to the rump ; any indent, either before or behind the wither, is a sign of weakness ; back strong, level, well proportioned down to the tail, which should be large, broad, and evenly placed ; hindquarters well rounded, well let down, and muscular down to the hock, with legs well set under ; the legs should be straight, stout, knees broad, and hoofs and horns, if any of the latter, clear.

MERINO RAM — POINTS.—The head should be in proportion to the body, neither too long and large, nor too small. A large-headed sheep is mostly of a sleepy, lazy disposition, and a small head is a sign of delicacy ; the poll slightly arched, with horns well set, of a clear, pale golden dun colour, free from spots or streaks of black, and taking a regular curve, showing distinct, with regular corrugations, and not too close at their base or to the cheek ; there should be sufficient room between to allow for a growth of wool, and for it to continue well on to the whole of the forehead, and in many cases to the cheek ; forehead very slightly arched, with room between the eyes to give an open, an intelligent appearance ; eyes bright, intelligent, but mild, and not too prominent ; face not too long, a trifle rounded, with two or three distinct ridges or wrinkles from each side of the mouth ; muzzle well rounded, nostrils wide ; a pinched nose and small nostrils denote a weak constitution ; the lower part of the face should be well covered with short, fine, soft velvety hair, and as free as possible from black spots. In the prize-ring these spots are not fatal, but if two sheep are of equal merit, otherwise the one with the least black spots would take precedence ; mouth clear, and perfectly free from any black spots or lines, with teeth regular and evenly set apart ; ears thin and fine, of medium size, and covered with short, fine

silky hair ; neck rather short, but evenly set, tapering towards the junction with the head ; back straight and flat, from which the ribs rise with a fine circular arch, or, as it is often called, "well-sprung ribs" ; shoulders broad and full, well developed, with a thick, fleshy forearm ; chest full, broad, and deep ; brisket broad and prominent, and well let down between the front legs ; the whole front should appear massive, and have two or three folds, the bottom one the largest, the whole appearing as a large apron ; these folds extend right around the neck, where they are smallest, and extend or enlarge as they come down the front ; belly straight, rump well rounded ; quarters long and full down to the hock, standing straight ; twist (that part of the inside thighs or junction of both hind legs) deep, wide, which, with the broad breast, keep the four legs wide, or open, and upright ; legs stout, good bones, but not coarse, nice flat knees, the whole well covered with wool ; hoofs clear and free from black lines or streaks ; pelt thin, fine, soft, but still strong, and should be of a pinky colour, which denotes health.

COVERING.—The wool of the merino differs, as there are now three distinct types—fine, medium, and strong, or deep-grown. It is necessary in each class that the wool should be of a vigorous character ; for breeding purposes pretty-woolled sheep should be avoided. What is wanted is a wool with body, draught, free, distinctness in



MERINO WOOL.

character, and no undue roughness or hairiness ; last, but not least, density. In a fine wool we rarely find a great length, although there is a fine combing class ; the growth is mostly short, the crimps particularly well defined, evenly set apart, and most numerous, and all wools having as many as 24 of these crimps to the inch can safely be placed in the fine wools ; the tips of the staples must be compact, level, and not pointed ; and they mostly have a small quantity of black yolk, in the shape of pearls, and thus derive the name “ pearly-headed tip,” and is a sure indication of a fine merino wool. Medium merino stud wools have a longer and bolder growth than the fine ; the crimps are also fewer in number, 18 to 23 to the inch, and they are also slightly more undulating, and, if measured, the diameter of the fibre is seen to be greater. This type of wool may be distinguished by the tip being flat or blunt. Strong merinos have the largest formation in every respect, a greater depth and larger-bodied staple, and the crimps, numbering from 14 to 18 to the inch, should be distinct, free, and even to the tip, which is formed like a club.

FLOCK RAMS.—Much attention is necessary when selecting rams, whether for the stud or for use in the ordinary breeding flock. For ordinary breeding purposes it is not expected that expensive classic sires, or even second studs, can be selected for use with ewes of the rank and file. What is wanted by the great majority of our pastoralists, especially those having limited or small holdings, are fairly good all-round, useful sorts of rams, suitable for the class of country, as well as the class of ewes. It is not to be expected that rams to be used in their ordinary flocks will be faultless ; far from it, but they should have as few faults and be as evenly balanced in body and covering as possible. The very bad points are : An effeminate head, or a wether head, which indicates a weaker constitution, and if introduced with the progeny means a weakly flock, with little wool. The devil's grip may be said to be about the worst of all defects, and

there is no other that is so readily and consistently transmitted. This may be called a malformation, in the shape of an indent or dip appearing first near the wither, and continuing down behind the shoulder, just the same as if a string had been put round that part of the sheep and tightened. In some young sheep this defect is so great as to give them a crippled or deformed appearance. Such sheep will never do good to anybody, being delicate and bad thrivers. A thin neck is a bad sign, implying delicacy ; also a narrow front, or breast, and brisket are most objectionable, being the forerunners of bad constitution, and an indifferent and unpaying animal. Avoid any rams with especially narrow backs, flat sides, weak quarters, and thin, small bones. As to the covering of, say, a useful-looking flock ram, any with a thin-pointed tip, open staple, too fine, too great a variety in his wool, thin behind the arm and near flank, also light on belly, are to be avoided ; also when the wool handles hard, harsh, and unnatural.

UNDERSHOT.—This term relates to the formation of the mouth of a sheep, when the under jaw or chin protrudes or overlaps the upper jaw. This is a very objectionable fault when present in a sheep, as it interferes with the gathering and masticating of its food. In many instances rams and ewes have this fault, and is generally transmitted to their offspring ; therefore, it is not advisable to breed from such sheep. Many high-class and artificially-fed sheep appear undershot to a slight extent. In such cases it is not a fault, as in the act of masticating dry and artificial food there is a tendency to cause the under jaw to slightly overlap the upper. Under these conditions the offspring will not show an undershot mouth.

OVERSHOT.—When the upper part of the mouth overlaps the lower, it is a fault equally objectionable as undershot, for similar reasons.



A RAM TO BE AVOIDED.



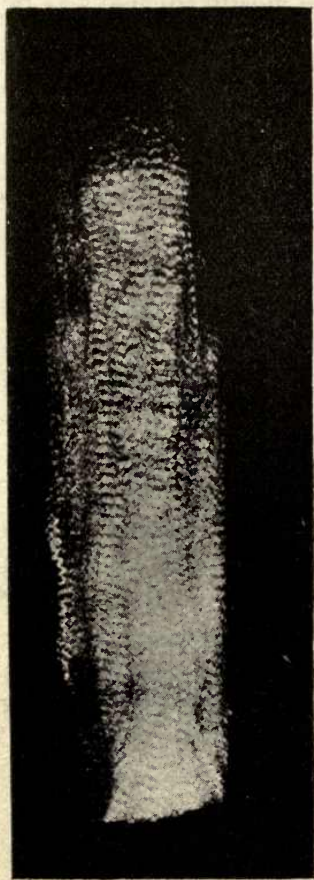
UNIVERSITY OF CALIFORNIA

FINE, MEDIUM, AND STRONG MERINO.—The N.S.W. Sheep-breeders' Association, at their annual show, have three classes—Fine, medium, and strong merino sections. To a great many sheep-breeders, both in and out of N.S.W., these three classes are received unfavourably, the contention being

that two classes, viz., fine and strong, are sufficient, and by adding the medium (an intermediate class) the whole becomes confusing. Outside the breeders themselves, those best qualified to judge the wool are the wool-buyers, who are in no way backward in giving their opinions that there are certainly three distinct classes of merino competing at our great international sheep show annually.

The varied climates and pastures of the different parts of the Australian colonies have certainly been the main factors in causing this distinction, which, together with the modern ideas of sheep-breeding, have gone hand in hand.

In other colonies where the temperature and general conditions of climate are more equal, the two classes, fine and strong, meet all requirements. In Tasmania the fine merinos up to date are most numerous, with a tendency to become fewer, as many



FINE.

$\frac{1}{1800}$ of an inch and over.

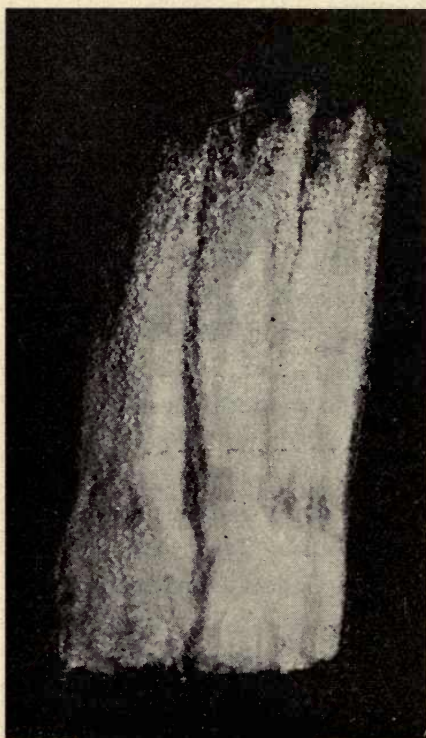
breeders are cultivating too much robustness for a fine merino. The strong merinos of this colony are comparatively few.

The Victorian climate specially conduces to length, and here the fine and strong classes can be pretty evenly balanced as regards numbers.

In South Australia the fine, and even the medium, are in a great minority, the strong merino predominating, and probably one general merino class would cover all contingencies.

In Queensland the stud farms are mostly situated side by side on the Darling Downs, where there are two classes, fine and strong; easy to distinguish at their shows.

Most of the influential sheep-breeders of the colonies, with the exception of the South Australians, come into open competition with their sheep at the N.S.W. Sheep-breeders' Association's annual show, Sydney, and a right royal battle it is.



MEDIUM— $\frac{1}{1000}$ to $\frac{1}{1250}$.

No doubt the three classes cause the competitors to study their entries at this show, thereby practically illustrating their own ideas of what constituted fine, medium, and strong merinos. Many breeders contend that because a sheep is classed as fine in their own district, they must certainly be entered as fine. This is where most of the glaring mistakes are made, especially when a fine merino, western Riverina, sheep is pitted against Mudgee, New England, Yass, Young, or Tasmanian fine-woolled entries. There is a per-

ceptible difference in fine wools of these districts, and even in the actual form of the sheep. It makes not the slightest difference

medium, whatever is considered by any breeder to be a fine, or strong merino if, on taking the average quality of a fleece, it is found not to come up to a certain standard; all the arguments available cannot make that particular sheep fine, medium, or strong. Taking the fine-woolled class only—especially the housed section—both exhibitors and judges appear to be mystified until the whole becomes a vexed question. Whether it is that the breeders are uncertain as to the opinions of the judges on what constitutes a fine-woolled sheep or not, this class, even at the last show (1899), contained sheep of different varieties of qualities. Amongst the prize winners there was not a fine-woolled sheep in the lot, and only one, and that one doubtful, in the whole of the entries in section A of fine wools.

This is not an individual opinion, but a general one.

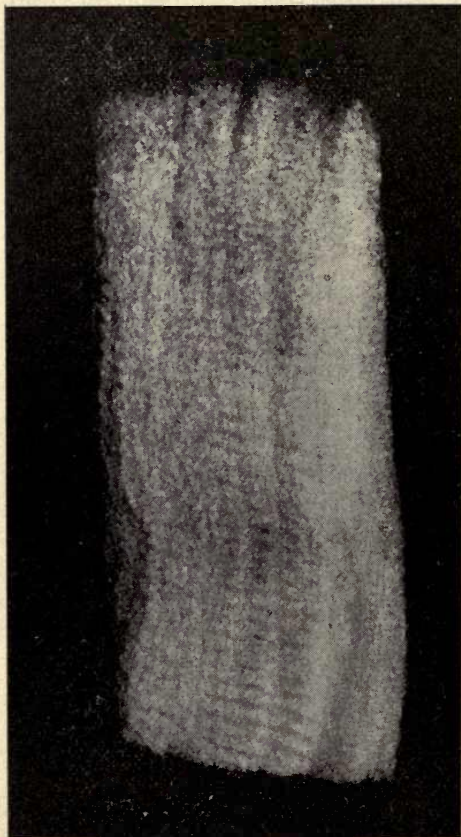
The great questions were, Where are our fine wools? How are we to distinguish them? It was generally acknowledged that the true fine-woolled merino was conspicuous by its absence from a great many sections. Every allowance must be made for a stud sheep, as it is imperatively necessary for such to show more vigorous and robust growth of wool; yet there is no reason why this class should show such varieties or mixture of grades. Considering there is such an amount of uncertainty amongst breeders and judges, and no reference as to what really is fine, there appears but one solution to the difficulty, which was advanced two years ago.

To deal with this matter, it has been suggested that, after all the sheep are in their respective places according to the opinions of the owners, let them be inspected by one, two, or even three qualified wool experts, giving them power to put any sheep into any other class they might think the proper place.

Let these experts judge nothing but the wool or covering, then when the sheep judge comes his labour will not be troubled with the fine, medium, and strong wool question. By so doing the disqualification of sheep will die a natural

death, as it should do. The sheep-breeders would only require to follow the entries at one or two shows under these conditions, after which very few wrong entries would be found in any of the sections. This appears to be the only plan to give the desired results, and no doubt this is the only method to instruct breeders and judges alike.

Many argue it will be a mistake to bring in a wool expert, contending that he does not know what is required in a breeding sheep, and would therefore judge the wool from a manufacturer's point of view. A qualified wool expert has only to examine the different classes of fine, medium, and strong stud wools, when he will go through the different lots,



STRONG— $\frac{1}{9}$ and below.

leaving them in a far more satisfactory state than under the present existing circumstances. If objections are raised against an expert who buys wool for the manufacturer, then there are others who are thorough experts, and who have for a number of years been amongst good stud sheep on large stations. Their wool experience, together with their annual work amongst stud sheep, undoubtedly fits them for the work of accepting or rejecting any sheep at any of our pastoralists' shows, either intercolonial or international.

Acknowledging that we have three distinct classes of merino, al-

though the fine wools are gradually disappearing, they must be catered for, but it is very probable that the standard will have to be lowered according to that of other countries. However, this should be left in the hands of the Sheepbreeders' Association.

Fine wool, at the present time, measures $\frac{1}{1300}$ of an inch, which is the lowest limit. Most of the prize-takers in the fine-wooled ram sections at our recent shows rarely measure $\frac{1}{1200}$ of an inch.

The medium class—the most useful class of all merinos in these colonies—should have a larger frame than the fine, stronger in the horn, coarser pelt—a more robust sheep all round, both in body and wool. The acknowledged measurement of this class varies from below $\frac{1}{1300}$ to $\frac{1}{1000}$ of an inch.

The strong class is a larger moulded animal than the medium, bigger in frame, with a decidedly stronger or thicker fibred wool measuring $\frac{1}{1000}$ of an inch up.

USES FOR MERINO WOOL.—The other class of wool is used to an equal extent with that from the merino sheep for the manufacturing of fabrics or tissues for the clothing of the human race. The varieties of merino wool are much more numerous than that of any other breed; therefore the greater aptitude for making so many more classes of fabrics. There is the short, fine, dense, crimpy, elastic fibred wool from Mudgee, with a world-wide reputation amongst manufacturers, which, because of its silky texture, is used extensively in the silk factories, and it blends with silk most readily. This special feature is not found in any class of wool other than the merino, which is used for the highest class of broad cloths. No wools but those of the highest quality and felting property can be used for making these woollen cloths, whilst the great number of lower sorts are specially adapted for the fabrics of various lower qualities. The Australian climate, above all others, has the tendency to encourage length, so that at the present time it may safely be said that fully two-thirds of the merino wool of these colonies is specially suited

for the combing process ; therefore, yielding a greater proportion of real fine combing wools, which were almost unknown fifty years ago.

The Australian merino combing wools are pre-eminently in advance of any other country in the opinions of all wool buyers, the climate having infused that valuable property of extensibility, fitting it in every respect for the most exacting spinning operations. We have only to examine the very thin or small, strong thread yarn used for making those delicate-looking tissues used so extensively in making *Mousseline-de-Laine* cashmeres, for ladies' wear, to see the exceptional spinning qualities of our best merino wools. Not only are merino combings confined to high-class goods, but a great number of their degrees of qualities, even down to the strong, retain proportionately their spinning capacity and usefulness for fabrics of lower grades.

THE LINCOLN.

This breed is the largest, and grows the strongest wool of the English breeds. The mutton is coarse-grained, and yields very large proportions of fat. It is a sheep requiring an abundance of food, and is best suited to heavy agricultural lands. If feed is scarce, the sheep loses weight rapidly, and when once in low condition is an expensive animal to put again into good condition. It is a good traveller, and will wander a great distance in search of food, but, when food is plentiful, it is lazy.

POINTS.—The head has a massive appearance, but should not be out of proportion to the body ; arched poll, broad and roomy between the ears, which are well set on side, and are rather broad, inclined to be thick, should be covered with soft white hair ; eyes, wide apart and full, intelligent and calm ; face not too long, but broad, with a full, bold, rounded muzzle, covered with a dark skin, which, under the white hair, appears of a bluish cast ; lips, rather



LINCOLN STUD RAM.



thick ; jaw, rather deep, yet straight ; the head is well covered with a large topknot of lustrous wool, extending down to the forehead ; neck inclined to be long, thick at the base, and tapering a little towards the head ; back, straight and broad, sometimes a trifle hollow ; the ribs well sprung from the chine, then tending to be straight ; body, long, with forward shoulders ; chest, full, broad, and deep ; sides, inclined to be flat ; legs, strong, standing wide apart ; knees, thick and broad, covered with short white hairs ; rump, well developed, but not too large ; the pelt is thick and coarse.

COVERING.—Lincoln wool is the longest and coarsest wool in the lustre class. The whole formation is massive, the staples thick and heavy, measuring up to 12 inches in length, but broad, wide, undulating, wavy wool, which should possess a glossy, silvery, or metallic appearance. Although the wool is so coarse, it handles soft, and is of a silky texture. In comparison with the Leicester, the Lincoln is much bolder in every respect, and there are not so many curves or waves as in the former.

Lincoln wool is made into fabrics of various descriptions



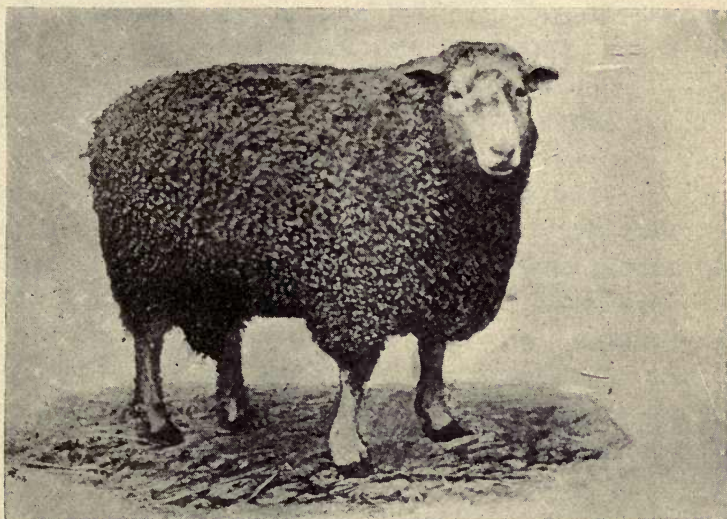
WOOL OF LINCOLN STUD RAM
Half natural size.

and designs, all of a heavy, smooth nature, many of which are dyed into most delicate shades, for which only the fine lustres are suitable, on account of their great reflective power, a quality possessed by Lincoln beyond any other breed, except Leicester, on which the wool is very similar in this respect. Such goods are damasks, reps, Russell cords, braid, lastings, linings, camlets, furniture cloths, serges, boot laces, bunting ; and much is even used for dolls' hair.

Spinning qualities vary from 24's to 36's. Lincoln and merino make a really good serviceable cross, and a suitable mutton for export, and many who have kept to that style of breeding have found good results in both the carcass and wool. Much of the Lincoln coarseness is lost when crossed with the merino, the offspring producing fairly fine-grained and succulent meat. The fat is more evenly distributed than in the pure-bred, and not massed in a few places, and the flesh is of a nice flavour, whilst the wool is one of the most serviceable crossbreds going into the market. As with the mutton, so the wool is refined very much, showing much character, still having a lengthy growth, with brightness, but more pliability and softness. It may be distinguished at the natural twelve months' growth by its lengthy staple, measuring six to ten inches ; is bold, showing more crimps than the Lincoln, and being decidedly finer, but not so lustrous. It is called a demi-lustre wool, and is used for making the fabrics called delaines, coburgs, tammies, orleans, shalloons, and such cloths, of a smooth, thin texture.

LEICESTER.

No breed of English sheep has been brought to such perfection as the Leicester, and certainly there is not one that impresses upon its progeny the good qualities of the type in such a pronounced manner. It is said that whatever breed the Leicester is crossed with, the result shows a greater resemblance to the Leicester parent, both in body and



LEICESTER STUD RAM.



covering, and it is further contended that it improves any breed it is put to. This is probably correct, especially if we look at the goodly number of English longwools which have been improved through the agency of the Leicester. Take the Lincoln for instance, which was one of the most ordinary looking longwools to be found, with its flat sides, long, thick, heavy, coarse legs, narrow, lengthy back, and unusually slow maturing capabilities. All these imperfections have been changed by a systematic method of breeding.

The wool of the Lincoln has been greatly benefited through the Leicester, which infused a softer and kinder texture, without diminishing the lustre, and adding a little more quality. Then there is the Border-Leicester, which is an excellent all-round sheep, both for mutton and wool. Here, again, are indications of the Leicester predominating, giving a beautifully-moulded and larger body, and the soft white Cheviot (with which it was crossed to produce the Border-Leicester) wool has been improved greatly by infusing more brightness, and, at the same time, giving it more body. The Leicester is hardy and vigorous on good keep, and it is said that it will produce a greater quantity of meat for the quantity of food than most breeds. As a traveller, not many breeds have greater powers of endurance. The meat is rather coarse-grained, whilst the fat is in masses, and is of a luscious nature.

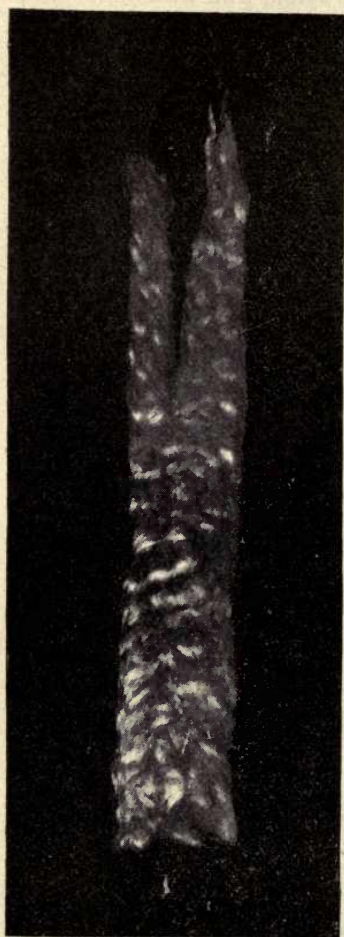
POINTS.—Head, clean, small, and well set, and covered with short, white hair; broad between the eyes, which are prominent, rather bold, with large orbits, which, in the ewes, cause a difficulty in lambing; face inclined to be long, and much sharper featured than the Lincoln; mouth, wide; muzzle, long; lips not too thick, and of a bluish colour; ears, not too large, and well set on the side of the head, thin and fine, and pointing backward, giving a sharp appearance; neck, thick towards the base, and tapering to its junction with the head, arching slightly, but not too short; back, flat, level, broad before and behind, from which the ribs must rise with

a circular arch, or rounded, and giving the body a barrel-like appearance ; shoulders broad and full, carried well forward and backward, so as not to leave a hollow behind ; should be well covered with firm flesh down to the arm ; breast, very full and deep ; belly straight ; legs straight, and fine in proportion to the size of the animal ; knees, broad ; quarters,

long and full, standing neither in nor out ; twist (junction of the inside thighs), deep, wide and full, which, with the broad breast, will keep the fore and hind legs open and upright ; pelt, thin, soft, yet strong.

COVERING. — The wool is classed with the Lincoln, as a pure lustre, and is used by manufacturers for the same purposes. When compared with the Lincoln, the Leicester has not such a massive formation, the staples not so long or so broad, whilst the curves or corrugations are more numerous, giving the wool a very inviting appearance, especially when the lustre is of the highest order. In sorting, the Leicester will give one sort finer than the Lincoln.

CROSSING.—Many maintain that the Leicester merino cross gives the best class of crossbred wool, as well as a profitable sheep for the market. Where there is good grass, clean country, and a good supply of water, the results are most satisfactory, the



WOOL OF
LEICESTER STUD RAM.





COTSWOLD STUD RAM.

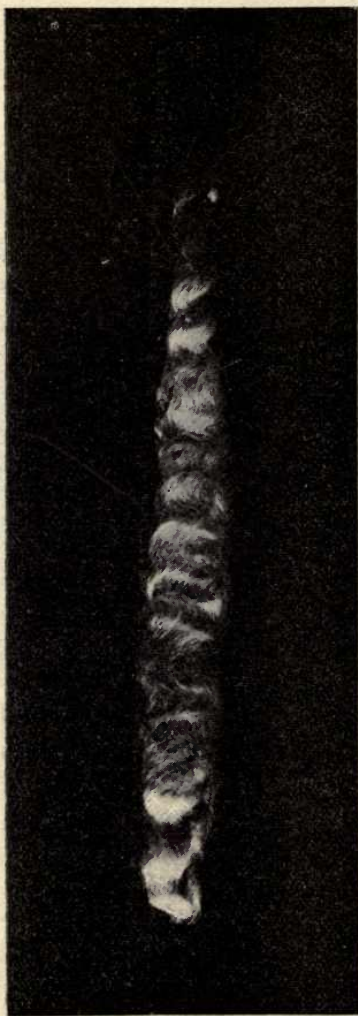
wool especially so, being in constant demand for combing purposes, on account of its grand length, character, quality and colour, and invariably giving a good, weighty fleece. The crossbreds are hardy, capable of standing a pinch, and taking into consideration the carcass and wool, will give profitable returns.

COTSWOLD.

The Cotswold is one of the most valuable long-woolled English breeds, and takes its name from the mountains of that name, situated in Gloucestershire and neighbouring counties. It is one of those hardy, thrifty animals, capable of standing hardships. Besides their great wool-producing capabilities, they are very early maturers, and the ewes are both prolific and good mothers. This breed at one time was considered the most valuable in England, and was in request by European countries; and it is said that the merino of Spain is much indebted to the Cotswold for its excellences. This probably is not intended to refer to the Transhumantes, or travelling sheep, of Spain, with their fine short fleeces. but more to the Spanish sheep of the plains and valleys, These valley sheep are called the Chũnah, and are altogether different from the mountain sheep in carcass and covering, being larger, heavier, and covered with a long, bright, bold combing wool, much finer than the Cotswold, and much coarser than the merino. This is evidently the result of introducing the Cotswold into Spain. The Cotswold has a little more quality than the Leicester, being equally long in the staple, but not so bold, and contains many more crimps. The wool has a soft feel and silky texture, spinning from 44's to 32's.

The mutton is rather coarse, but succulent, and the fat is fairly well distributed. Young sheep or hoggets weigh 25 to 28 lbs. per quarter, and when over two years old 35 lbs.

POINTS.—Head has a strong, massive appearance without horns ; ears well set apart, and well back on sides, and roomy between them ; face well covered with large tuft, or top-knot, hanging well down. Eyes mild and broad between ; orbits large. Face long ; jaw deep ; Roman nose,



COTSWOLD RAM'S WOOL.

and round muzzle, covered sometimes with white and sometimes with grey, with legs to match, taking after the Downs tribe. Neck short, but broad, and tapering slightly towards the head. Back large, straight and broad ; ribs well sprung, giving a round body. Front not too prominent or square ; shoulders set back ; quarters heavy, square, full and broad ; thigh solid and heavy, with deep flanks. Belly straight. Legs of moderate length, bone strong, and not so fine as in the Leicester. Has a stylish appearance, good carriage, and is a vigorous and hardy sheep.

COVERING.—Amongst the manufacturers there is no other strong wool held in such high estimation. It is one of the very brightest of the demilustres, but is not considered to be a pure lustre like the Lincoln or Leicester. It grows to a good lengthy staple, which is not so bold as the Leicester. The curves are pronounced,

showing what is generally called the curliest of British wools. Its great value rests in its exceptional silkiness, softness and pliability, which qualify it to be spun to its extreme length. The average quality is 44's.

CROSSING.—For crossing with the merino the Cotswold has advantages and disadvantages. The advantages are that the progeny are exceptionally well suited for the frozen mutton trade, as the two types appear to nick or blend together, producing a well-balanced carcass, and covered with a most valuable crossbred wool of exceptional quality. For early maturing, few crossbreds are equal to this strain, and none can stand more hardships nor give better returns. The wool of all crossbreds is most valuable from a breeder's and manufacturer's standpoint. For the former it has a good return in weight of fleece and value per lb., and for the latter a wool capable of being made into high-class fabrics of any dye. There is no breed of sheep that blends so well with the merino as the Cotswold; the lengthy, silky nature of its wool is improved in fineness, quality and character, whilst density is improved.

The disadvantages are that the merino ewes lambing after being put with the Cotswold often die. Cotswolds are large-headed sheep, and the progeny naturally incline that way, so that the ewe has great difficulty in giving birth to the lamb, and thus many ewes lose their lives.

ROMNEY MARSH.

Few sheep can stand exposure so well as this breed, having been acclimatized for generations on the bleak marshy coastal districts of Kent. Although not a handsomely-moulded sheep, it possesses advantages above all other breeds, in resisting foot-rot and fluke. This is their main recommendation; and they have proved a success in heavy, low-lying land, where all other breeds have become failures. It is of the coarse long-woolled variety, and is classed in the demi-lustres, and is a most desirable wool. In New Zealand, where there is much heavy, low-lying land, the Romneys have been introduced successfully, and have given excellent results when crossed with merinos. Few crosses give equal results, and none better, both as a mutton and wool-bearing sheep. As freezers they are almost an ideal sheep—useful weights (about 60 lbs.), joints well balanced and plump, fat not excessive and well distributed, and the flesh has an agreeable flavour.

POINTS.—Romney Marsh has a heavy, thick, massive head, without horns; ears well set down on the sides, and wide apart, thick and covered with white hair, and space between should be covered with wool or top-knot, but sometimes this is missing (this would be fatal in the show ring); eyes rather prominent, mild, and inclined to have a heavy look; forehead broad, with open expression; face arched, bold, and long down to the nose, which is rounded, with thick nostrils; jaw deep, strong, and covered with white hair, the muzzle being dark gives it a bluish appearance; neck thick, long, and slightly arched, broad at the base, and tapering slightly at the head; back long, but wide on the loins; thighs full, which carry most weight; tail thick and heavy; sides rather straight or flat; belly large or full; forequarters narrow, and not deep; legs thick, strong, and standing upon large feet.

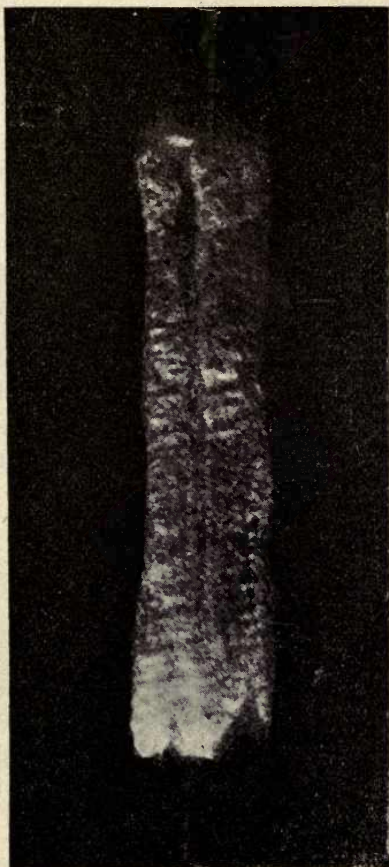


ROMNEY MARSH STUD RAM.

Kerry & Co.



COVERING.—The Romney Marsh wool is not well understood in these colonies; a mistaken fancy in many instances has altered the type. The mistake is that these wools resemble too much the Lincoln or Leicester types, the result of using those breeds to infuse lustre and extra strength or coarseness. The plate is an excellent specimen of a Romney Marsh wool as it should be, being from a high-class stud ram. It is of the demi-lustre class, with a commanding length and an undulating crimp. The fibre is much finer than the Leicester, resembling more the Border Leicester, and is of a kind, soft nature, with an average spinning capacity of 46's.



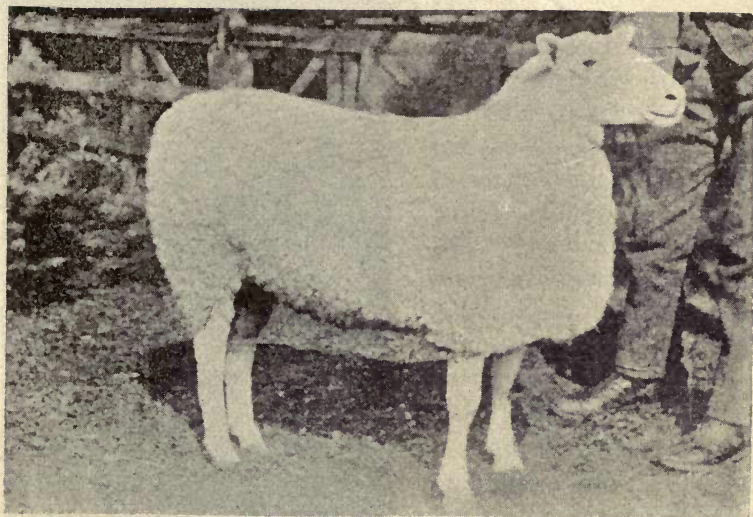
ROMNEY MARSH RAM'S WOOL.

CROSSING.—The cross-bred wool will compare favourably with any other, both in its appearance and qualities. It has a lengthy, bright, crimpy staple, compact and even throughout, and is a kind, soft handling wool, with a pliable and pure fibre.

BORDER LEICESTER.

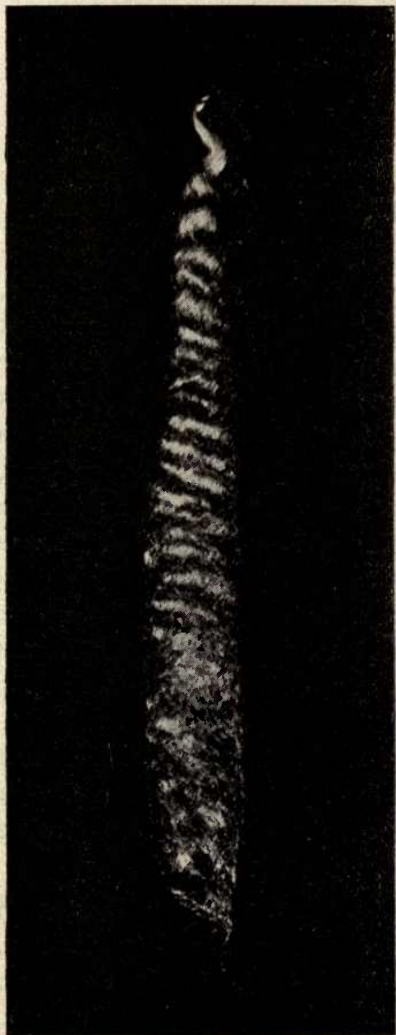
This breed is really a cross between the Leicester and the Cheviot, and was bred with the idea of improving the latter. The result was so satisfactory that, by careful management and cultivation, there was produced a special type, and it is now a confirmed breed, acknowledged by all the agricultural societies throughout the world, and is awarded special prizes. The object of founding it was to produce a good traveller suited to the Cheviot Hills, the home of the Cheviot, running into Scotland, and at the same time give a good butcher's carcass. The Border Leicester derives its name from the hills in Northumberland, bordering on Scotland, and the breed of sheep (Leicester) introduced to improve the native breed—thus Border Leicester.

POINTS.—Head well set on, and perfectly free from wool ; rather broad between the eyes, diminishing towards the crown, and not too heavy behind the ears, which would cause difficulty in lambing ; face, long, with rounded or Roman nose, and covered with short white hair, but not so wiry as in the Cheviot, extending back behind the ears ; ears, fine, soft, set well up, and pointing backwards, but not drooping, white inside and out (sometimes black spots appear with age) ; body is very similar to the Leicester, differing only in having a higher or more rounded rump ; back, broad, level, with well rounded body ; belly, straight, comparatively light, said to carry little offal, giving the animal a leggy appearance when without its wool ; legs, on which the sheep stands squarely, are bare or free from wool, a little finer than the Leicester ; should have a light, stately carriage, and is a good traveller.



BORDER LEICESTER STUD RAM.





BORDER LEICESTER RAM'S WOOL.

COVERING.—The wool is of the second demi-lustre class, and is a great favourite with the manufacturers, as the introduction of the soft and silky Cheviot strain, blended with the Leicester, imparts a kind silky texture, so necessary in a high-class spinning wool; staples are a commanding length with a nice undulating crimp, not so massive as the Leicester, but much finer, and an excellent combing wool, which can be spun up to 46's. The wool is used for making fabrics, mostly for ladies' wear, viz., delaines, coburgs, orleans, moreens, baize, etc.

CROSSING. — Taking the Border-Leicester ram and the merino ewe; few crosses give such satisfactory results. The offspring are hardy, travel well, and can endure hardships. Under favourable conditions there is an excellent butcher's meat, nice, succulent, lean, and not too much

fat. The lambs come on early, and find a ready sale. As a crossbred wool there is no better put on to the market, having a soft, kind, silky texture, the merino strain giving quality and character, with a desirable combing length. Very frequently the finest wool of this cross is more valuable than some of our strong merinos for combing purposes.

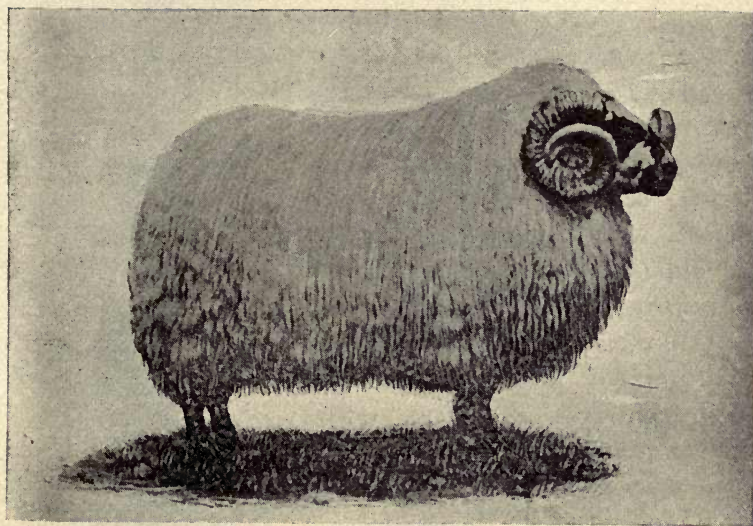
SCOTCH BLACK FACE.

This is one of the hardiest of British breeds, especially adapted to withstand great exposure in the rugged uplands, and will exist on sparsely-grassed, mountainous country, taking little or no heed of frost or snow. These sheep have a good carcass of tasty meat, full of lean, and not overburdened with fat. After the sparse and mean living on the hills, if these sheep are put on to good fattening land, their weight increases rapidly, and they find favour with the butcher, who retails the points as prime, and always finds a ready sale.

The Black Face is of a wild and suspicious temperament, but soon settles down when brought more regularly in contact with man. The ewes are very prolific, and in a flock fully three parts will give twin lambs.

In their native home these useful sheep, when in large flocks, have a leader, always a ram, and, when there is danger near, will form themselves into a body, the leader placing himself in front, ready to resist an intruder.

POINTS.—Head large, clean, masculine, with Roman nose ; nozzle thick ; face short, and covered with variegated, sometimes all black, close, hard hair—frequently the colours, white and black, are clearly defined, and not running into each other ; both male and female have horns, the male's especially being showy, nicely curved, and set close to the side of the head ; the neck is rather short, but strong, being nicely crested ; back straight, not too long ; chest deep and broad, with wide brisket ; shoulders rather little ; ribs are well sprung and deep, giving the animal a barrel shape ; hind-quarters deep, fleshy and square, imparting a fine



BLACK-FACED SCOTCH RAM.



symmetry to the frame; strong legs, especially from the knee upwards, well placed under the body, and of a jet black colour; feet large, having open hoofs, with springy pasterns; the movements are most graceful, more so than in any sheep reared on the lonely and hilly country.

COVERING.—The fleece is a mixture of wool and hair, the undergrowth being fine and silky, and the exterior very coarse, hairy, and kempy. The wool grows to a great length—twelve to twenty inches—slightly wavy, the end of the staple long, hairy, and, when full grown, will reach to the ground. Manufacturers use this wool for making coarse serges, guernseys, stockings, tassels, druggets, carpets, homespun woollens, blankets, and horse rugs.

CROSSING.—Very little crossing of the Black Face with the Merino has been done but, when it has been tried, the offspring, as a mutton sheep, resulted most satisfactorily, and was pronounced prime. Nothing advantageous could be said of the wool, and it could not be expected that the finest woolled breed, put to the strongest, or partly-haired breed, would give a desirable wool.



SCOTCH BLACK-FACE
RAM'S WOOL.

CHEVIOT.

This breed derives its name from the Cheviot Hills, running through Northumberland and Cumberland, and into the South of Scotland. For a hilly country this is a most valuable sheep, being adapted for an active life amongst the lightly-grassed pastures where it is a native. Upon good pastures improvement commences at once, and goes on

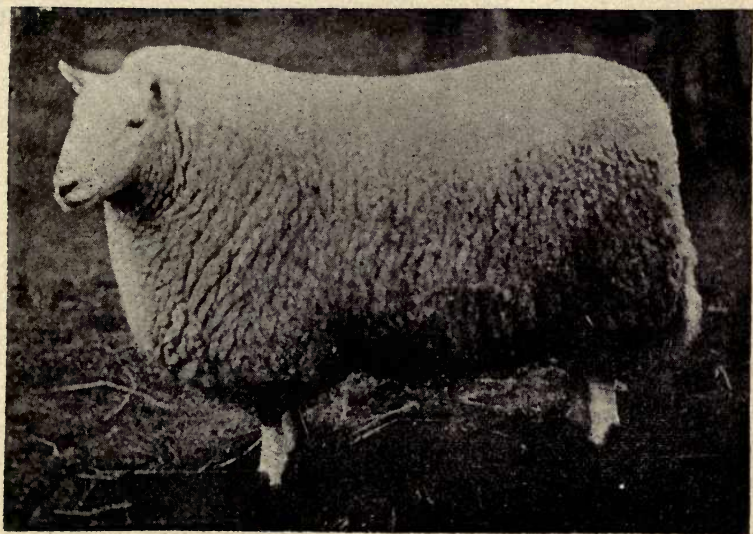
rapidly, and it will leave behind most other breeds, and be ready for the butcher in a much shorter time. The ewes are good mothers and prolific.

POINTS. — It cannot be said that the Cheviot is a handsome sheep, having a broad forehead, and wide between the eyes, with space between them and the ears; face rather short, and covered with very white, short, hard hairs—they are often called the White Faced breed; ears long and pointed and white; body long, narrow, with slender forequarters; ribs rounded, and hindquarters good: legs small, and covered with wool, also the body, excepting the face. It is a hornless breed.

COVERING.—The wool, which is of a very desirable class, is frequently known



WOOL OF CHEVIOT STUD RAM.



CHEVIOT STUD RAM.



as "Blue Wool." It has a nice combing length, particularly soft, pliable, and of good spinning capacity. Sometimes there are to be found kemps in the fore and after part of the fleece or britch, which are much coarser in comparison with the rest of the wool. The wool is greatly used for making tweed and Cheviot cloth.

CROSSING.—On account of the rather irregular body, the Cheviot is not suitable to cross with the Merino. It crosses remarkably well with the Leicester, when the carcass improves all round; also the wool and fattening qualities increase.

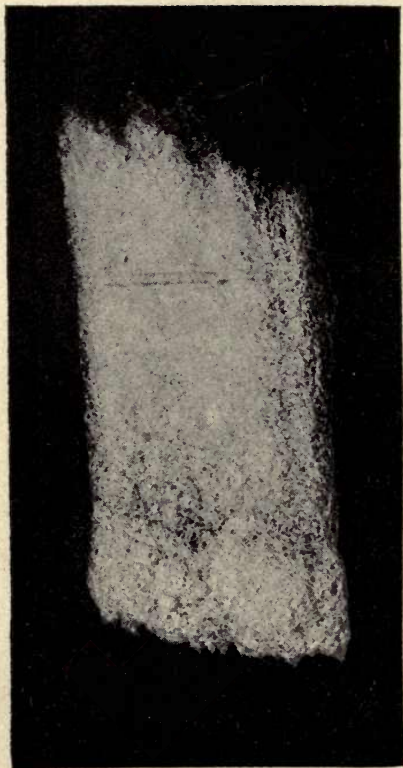


SOUTH DOWN.

This is the prime mutton breed, and was originally found on the large chalky downs running through the South of England.

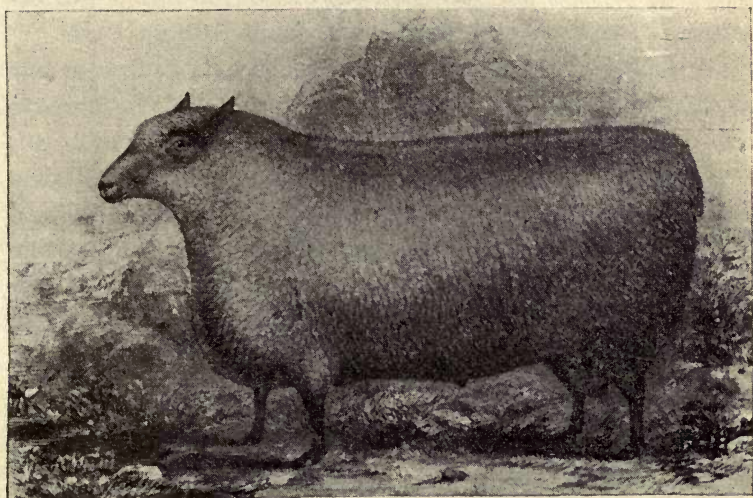
POINTS.—Head small, hornless and beautifully arched, and well covered with wool; forehead not too wide; ears placed well up, small, fine and soft; eyes full, bright and intelligent; face rather short, and covered with light brown or mottled hair; neck thin at the head, and enlarging towards the shoulders, and not long; chest well let down between the forelegs, and having a massive, bold appearance; shoulders large and on a level with the back, and arched outwards from the top of the breast, giving room

for a springing rib underneath; back flat from the shoulders to the tail, the ribs coming horizontally from the side, the last rib projecting; loin broad and flat; hips wide, with broad, massive thighs; belly straight as the back, and well protected with wool; legs of medium length, covered with wool to the knees, and are fine, without weakness, and covered with a speckled or dark brown hair. The pelt is fine or thin, very pliable, but strong.



SOUTH DOWN WOOL.

THE COVERING.—The wool of the South Down is the finest of the English breeds. It is placed as a short clothing or hosiery wool. It grows up to 2 in. in length, rather plain or



SOUTH DOWN STUD RAM.



straight in the fibre, and has a mushy or open and broad tip, which gives it a wasty appearance. It is inclined to be of a chalky and harsh nature, and it is well adapted for making flannels and hosiery goods, as it has little or no felting properties.

In a well-bred sheep the wool on the back should be perfectly free from grey or black fibres, whilst all around the edges of the fleece from neck to britch should be grey, *i.e.*, a mixture of white and black, but should be confined to the skirtings, and not to run too deep into the fleece.

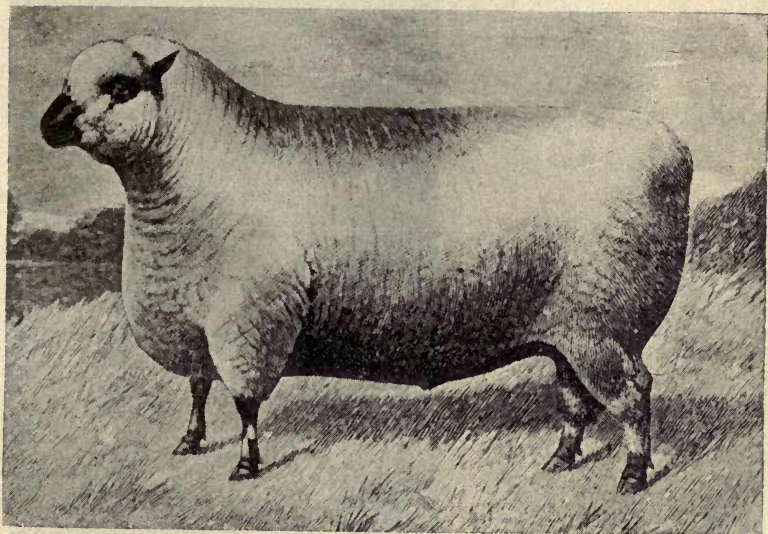
As a mutton sheep the South Down is not surpassed, and is always classed as prime. No mutton is so succulent or gives such an amount of evenly-balanced joints carrying the same amount of meat, good and lean, with the fat so evenly distributed. Early maturity is also a special feature in their favour. The lambs grow quickly and fatten easily, and are ready for the butcher at an early age. The ewes are very prolific and excellent mothers, and will stand a bad season and appear well when other breeds fail.

For crossing with merino for mutton purposes and for early lambs there is no breed its equal, the meat being of excellent quality. Much cannot be said of the wool of the Downs merino cross; the fleeces are usually light and short, and not so kind, and generally a little open. The fibre is plain, but not so much as in the South Down, the merino strain giving a little more crimp. It is a useful hosiery wool.

SHROPSHIRE DOWNS.

There is a great amount of uncertainty as to the origin of this most useful Downs breed on the one side, though on the other the Southdown is without doubt the predominating parent. Several authorities agree that the Shropshire is the result of the cross between the Southdown and a shire sheep, named the Morfe Common sheep, named after a tract of land in Shropshire. Very probably that was the origin of the now acknowledged breed of Shropshiredown. It is on a larger scale than the Southdown, from which it is distinguished by having a larger and broader head, covered with black wool, which also covers the legs. The body also is not so compact, and has not that beautiful symmetrical appearance, especially the hind part, whilst the covering is longer and not so fine as the Southdown. The Shropshire fatten easily and mature early, the mutton being of a superior quality, and always finding a ready sale. For hardihood, and as foragers, few breeds, if any, can compare with this undoubtedly profitable breed, apparently suited to most varied pastures in different climes. Ewes are very prolific, generally giving twins, and, occasionally, three lambs at a birth.

POINTS.—The head is often described as good, and in proportion to the body, appearing long, not too fine drawn, and hornless; poll, nicely arched, and well covered with short grey wool, often extending well down the face, while not too long, but bolder than the Southdown, and not so large as the Suffolk, a kind of intermediate between the two; muzzle, well rounded; ears, thin, fine, and not too large, and evenly placed on the side of the head, the whole covered with black wool (sometimes, but rarely, spotted black is the correct thing); neck, thick, not too long; back, straight and broad right on to the tail, and quarters rather inclined to be straight and narrowing down to the hocks, a little out of proportion with other parts of the body; ribs, arched, coming well down



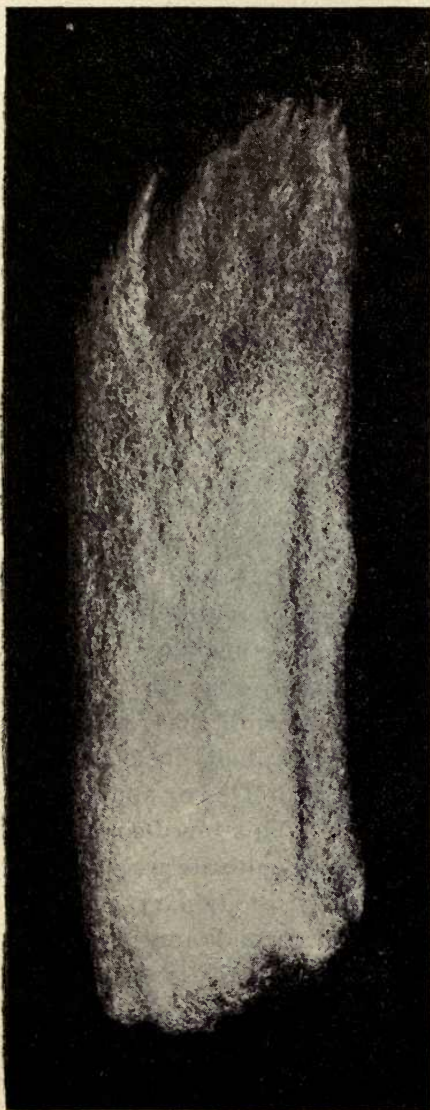
SHROPSHIRE DOWN STUD RAM.



the sides, giving a large body ; front, exceptionally good, with broad, well rounded chest, coming deep down between the forelegs, with plenty of room ; shoulders, forward ; girth,

deep from wither to behind the shoulders, with good fleshy elbow ; belly, large, but giving a little towards the flanks ; legs, short, and appearing a little fine for the body ; wool should come well down to the knees and hocks, the rest black.

COVERING. — The wool is a little more robust compared with the Southdown, growing to a greater length, and when of a free growth is well adapted for combing purposes. At the present time the best of the Shropshire is taking the place of much of our strong merino, on account of its better spinning capabilities. The fleece or body wool should be perfectly free from grey or black fibres. The same should be exclusively confined to the edges of the fleece, otherwise this breed is



SHROPSHIRE DOWN RAM'S WOOL.

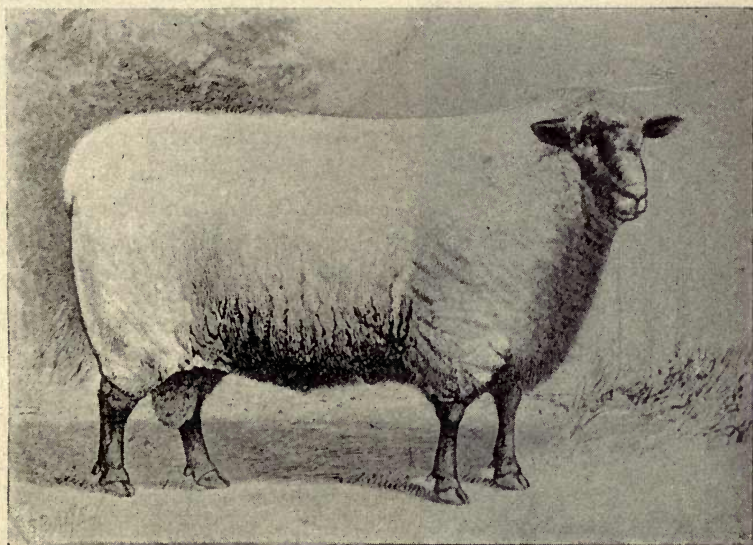
not pure. The best Shropshire wool is frequently combed into 60's and downwards, and used for a kind of soft delaines and coburgs. The shorter makes excellent hosiery and flannel goods.

CROSSING.—Shropshire merino takes a foremost place among crossbreds, the result of many and varied trials in these colonies. The mutton is of the highest quality, good square joints, and not over-burdened with fat. For early maturity no class of sheep has excelled this important breed, nor is so well fitted to many pastures in the Eastern Division of N.S.W. Under ordinary circumstances, lambs can be got ready for the market at six months old, which would be heavier than any other cross (excepting other Downs crossbreds) at eight month old.

SUFFOLK SHEEP.

This breed is working itself up into one of the foremost places in England as a good mutton and wool producer, with a vigorous constitution. The Suffolk originated by crossing the South Down with the old Norfolk, a breed little known and now almost extinct. Norfolk sheep had large frames, black faces and legs, and were very hardy ; the flesh was fine in the grain, and of a good flavour, and with a large quantity in proportion to live weight. The Suffolk in body and formation resembles an enlarged South Down, and on the average weighs 25 per cent. heavier. This breed commends itself to all agriculturists who want to cultivate weight with quality of mutton and fleece. It is inclined to be lazy, and puts on weight readily. Under favourable conditions the ewes will return 60 per cent. of lambs. For early maturity they are especially noted, and the weight of young lambs is rarely equalled and never beaten by any other breed.

POINTS.—The general appearance is a level, square, massive sheep, resembling an enlarged South Down in body, with a much larger head every way. The head is hornless,



SUFFOLK DOWN STUD RAM.



mostly free from wool ; very wide forehead, and wide between the eyes ; short, blunt face ; broad nose and muzzle ; ears thick, rather large and long, and well set on the sides of the head—quite a contrast to the South Down and other Downs breed ; neck short, thick, and almost level with the back ; back long, and has measured 48 in. from the ears to top of rump, is broad, graceful, and level the whole length ; ribs well sprung, very well rounded, with deep, powerful shoulders ; broad chest, and beautifully let down between the brisket, which is large, and coming down low between the front legs ; girth exceptionally large, and in well-grown sheep many Suffolk have measured 57 in. around after shearing, with the tape drawn tight ; good length from shoulders to thigh, which is massive, deeply let down on to the back, the whole body having a large and graceful appearance ; legs thick and substantial, and not short.

COVERING.—It is in no way inferior to the best of the Downs family, and on account of the large size of the sheep the fleeces return most satisfactory weights. The longest is sometimes used for combing purposes, but it is not particularly well adapted for that purpose, as the staples are not as distinct and free as is necessary for this process. It is



WOOL OF SUFFOLK DOWNS
STUD RAM.

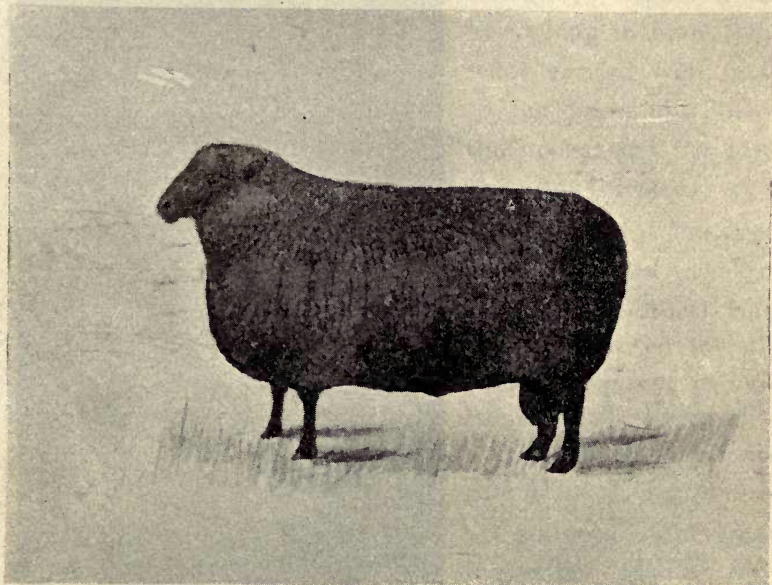
a real good hosiery wool, being a little open and loose, and will not felt readily, and is used for making open, fluffy, soft yarn for flannels, best blankets, shawls and clouds ; and it is held in high estimation by the manufacturers.

CROSSING.—This breed is deserving of much more notice than it has received, and a cross with the merino will compare favourably with the best tried crosses for both size and quality of mutton, combined with early maturity.

HAMPSHIRE DOWNS.

Very few breeds of sheep have undergone such improvement as the Hampshire, and now, instead of finding a small, irregular sheep, cultivation has transformed it into a really nicely-moulded animal. Its origin is doubtful, but the probability is that it is the result of crossing the native Hants with the Wilts sheep, both of which had striking characteristics of the Downs families. Now the Hants are a larger sheep than the Shropshire, with an equal capacity for improvement and laying on flesh, which is considered to be prime by *connoisseurs*. Like most of the Downs sheep, these Hants can stand severe times, and live on scanty, short grass, and appear to thrive well. It is one of the foremost breeds for early maturity, especially the lambs, and to quote an authority, increasing from 19 lbs. at birth, till, at eight months, it will weigh 150 lbs. live weight.

POINTS.—Head large and covered with wool, face short, full Roman nose, with rounded muzzle ; face varying in colour from black to dark brown ; ears rather large, placed well back on the side of the head, and more pointed than the Southdown ; neck inclined to be long and

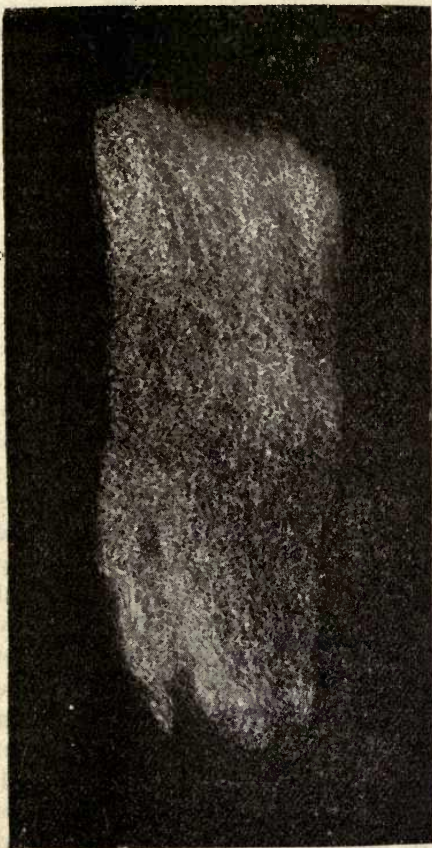


HAMPSHIRE DOWN STUD RAM.

thick; back, from the wither, straight, with a good, round rump; straight flanks, and inclined to be narrow in the hindquarters, and not deep from the flank to the shoulders; shoulders not so deep and broad as the South Down; belly straight; legs rather heavy, big in bone, with wool carried well down to the knees and below the hocks, and the same colour as the face.

COVERING.—The fleece is of good quality, ranking amongst the finest English, and used for the same purpose as the South Down. Skirting, or undergrowth, is a mixture of black or grey.

CROSSING.—For crossing, the Hants have proved very valuable, even when put to the merino. The lambs mature early, and make good weights.



WOOL OF HAMPSHIRE DOWN
STUD RAM.

THE DORSET HORN.

The Dorset Horn is almost a stranger in these colonies, and here the opportunities of proving its usefulness are very limited. When they are well known, few sheep stand so high in the estimation of practical graziers for their all-round usefulness. The Dorset Horn has been acknowledged a pure breed from the early history of British sheep. Their prolificness alone brought the breed into great prominence, standing as it does far ahead of all others in that respect. It is claimed that the ewes are so constituted as to yield two crops of lambs in every twelve months, and then to live above the average age of sheep.

As to prolificness, a Yorkshire grazier a few days ago told me that he had known a Dorset flock of ewes to produce at one lambing 17 per cent. of single, 60 per cent. of pairs, and 13 per cent. of triplets, with only three or four weakly lambs in the entire drop. It is from this breed that the Christmas lambs are produced in England, the ewes being timed to lamb early in November, giving six or seven weeks for artificial feeding and preparing them in a good marketable form. The reputation of this useful breed rests almost entirely on its prolificness, being also, however, strong, hardy and active. It is a wilder animal than the South Down. For many of our small graziers and farmers with fair, light land, and not too far away for trucking, there is no other breed that will give such good results, if they confine themselves to early fattening for either the export or local trade. There would be a certain quick return for a lamb, for which there is such a demand. It would not pay any farmer to cultivate the Dorset for wool alone. The idea must be to fatten as soon as possible, and then get rid of them.

POINTS OF THE DORSET.—The head is rather large, with a pair of massive horns after the style of an enlarged merino, but not so deeply corrugated; they are broad at their base, allowing space for the growth of a little wool between, developing into a top-knot on the forehead. The face is long and very broad, with a rounded, bold muzzle, the whole covered with white, soft hair. The neck is short and thick, and should be well rounded across the wither. The back long, straight and broad, terminating with a well-developed, rounded rump,



DORSET HORN STUD RAM.



with what may be called a second thigh, but is not so deep or well-proportioned as the South Down. The ribs are well sprung, but not so well rounded as most of the Downs breed. Chest fairly deep, very prominent and full; shoulders broad, with good forearm; brisket broad. The legs are longer and stouter than the South Down, giving a substantial or rather heavy appearance, and are covered with white, fine hair. Compared with the South Down, the Dorset is not of the same well-balanced or even proportion as the former, although the latter is a serviceable, desirable mutton carcass of a meaty, succulent nature.

COVERING.—The wool is one of the fine types of the British breeds, with a fair length, and may be classed amongst the fine combings. It has not the same character as found in the South Down, being a little plainer or straighter in the curves. It is one of those white-looking wools, even more so than any of the Downs, besides having an advantage over them by being freer of grey or black, straggling fibres. The grey, when found, is in small streaks on the outside, or skirts of the fleece.



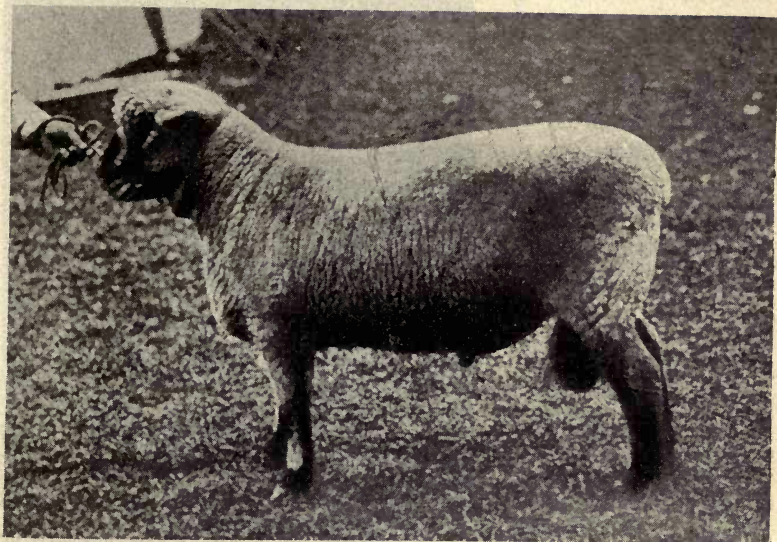
WOOL OF DORSET HORN STUD RAM.

CROSSING.—For crossing purposes with the merino, if carcass alone is first consideration, there is no cross that will give better results, none so good if fattening lambs quickly is the main object. There is an especially suitable carcass for export, being well balanced, with a great proportion of succulent lean, and a minimum quantity of fat. A sheep of this cross can be produced at about 12 months, weighing 45lbs. to 55lbs., and with a little more feeding, will well repay for any extra trouble in this direction. If a real mutton producer is required, there is nothing to equal the Dorset-Shropshire cross for weight of mutton at the same age. This cross is extensively cultivated in England by farmers of great experience, who claim to be able to put on the market a greater weight in less time than by any other cross. The mutton is sold as prime, realising the highest prices, being a great favourite with epicures.

OXFORD DOWNS.

The Oxford Downs breed may be said to be the most recent addition to the many celebrated Down families. There is not the same beautifully-moulded form when compared with either the South or Shropshire Downs' sheep. The breed originated by crossing the Cotswold rams with the Hampshire Downs ewes, the combination giving a rather irregular or crossbred appearance to the descendants, both in form and covering. The Oxfords are very good mutton sheep, having a large carcass, weighing from 70 to 90 lbs. at about twelve months old, but the lambs do not mature so early as most of the other Downs families.

POINTS.—The head is inclined to be large, with deep jaws, well-rounded muzzle; face, straight, with an open countenance; eyes, wide apart and prominent; forehead, broad; ears, heavy, but not large, well set back, with a rounded space or poll between. The face is covered with a tawny-coloured, fine hair, sometimes speckled; the forehead



OXFORD DOWNS STUD RAM.

and poll well covered with wool, intermixed with grey, as in the other Down breeds. Neck is inclined to be long and thick, giving a loose appearance; back, long, straight, and well-rounded, the ribs being well sprung; rump well-rounded, with a second thigh, giving a large appearance to hind-quarters; body large, with fairly arched ribs, and

large and prominent shoulders, but not deep-breasted, which gives the sheep a rather leggy appearance; belly, straight; legs set back, appearing a little heavy or strong, and covered with brownish, short hairs.

COVERING.—The wool is the longest of the Downs, is inclined to be loose and open, and of the straight formation. It is a little brighter than usual in Downs wool, the Cotswold having imparted that quality, together with a softer and kinder texture. The body wool should be free from black in the breeding flock, the undergrowth, breast, and throat, and round the head intermixed with brown - grey wool.



WOOL OF OXFORD DOWNS STUD RAM.

THE SHEEP SHOW RING.

There are not many more exciting times in a sheep-breeder's life than when he is entering into competition with his fellow-breeders on a neutral board. For many months his special bred stud sheep have received most of his attention, daily looking for something he does not wish to find—imperfection or faulty points in his sheep.

However, having entered his sheep into competition, he must leave the rest to the judge and stewards, the one to place them according to merit, and the others to see that the proper sheep are being judged, and, above all, to see that they are handled carefully, so as to minimise accidents. It is to the handling of sheep that this paragraph refers, for sometimes the unfortunate animal falls into careless and rough hands, and is frequently unnecessarily knocked about.

HOW TO HOLD A SHEEP FOR THE JUDGE.—There is nothing in connection with a sheep show that cuts up a breeder more than to see his sheep roughly handled. The men engaged to hold these sheep never consider that they are in charge of a sheep worth sometimes 1000 guineas, and frequently more. Generally speaking, this fact rarely, if ever, receives any consideration from the holder. Gentleness has a great effect upon sheep, and if they are approached quietly, with more persuasion than force, there would be no necessity for the dragging and rough handling which is frequently seen. The steward, when handing over a sheep, should impress upon the holders not to be rough, but to take their sheep as quietly as possible. It would be a further improvement if the steward had always a spare holder at hand, so that he could render any assistance to anyone in a difficulty, for most certainly many of these highly bred and fed rams require two instead of one to handle them. However, approach the animal quietly, and if any way fractious get hold of him by the horns securely, and do as little struggling as possible.

To tussle unduly with a sheep sours his temper, and he will become very obstinate, probably necessitating his being carried, which is no little weight, even for two men. If allowed, most of the sheep, when let out of their pen, will walk and follow the first sheep on to the judging floor. When there they should be secured by taking hold of the horns of a ram, or the side of the jaw of a ewe, placing them exactly where the judge points out. The sheep will now be standing with his rump to the judge, with the holder facing the sheep and holding its head. The sheep, if allowed, will settle itself in its most natural position, when the judges consider him. (If its head is held high, or it is pulled or pushed, the sheep becomes restless and uneasy, causing the holder to have a bad time). In this position the judge will satisfy himself as to the value or merit of the respective points, excepting the under part. The judge now wants the sheep to be turned up so as to expose the belly, legs, front, and brisket. To a holder this is the most difficult part of his task, requiring tact, together with the assistance of a little strength, judiciously laid out. However, it is not necessary here to explain the generally dangerous methods frequently practised, but to explain the readiest, easiest, and safest method, and there is only one.

HOW TO TURN UP A SHEEP.—When the holder is required to turn up a sheep he should take his place on the near side, retain hold of the horn with the left hand until the sheep is quiet. The next move is to place the left hand well round and under the throat, then, with the right hand, take hold of the near hind leg, lift gently in a direct line with the side of the sheep, neither pulling nor pushing it to or from him, but straight. The hind leg now being close on the side, lift the front of the sheep, and, in so doing, let it go gently on to its near thigh or rump, when it will fall gently into its position between the legs of the holder. In this position the judge can minutely examine every point on what is called “underneath.” A holder handling sheep in

this way will receive congratulations from the owner, who knows that all possible care has been bestowed upon his valuable property, the judge will not be backward in showing his appreciation, whilst the holder himself will shake himself by the hand, being self-satisfied that he has run no risks of injuring the sheep, and that the work was done with comparative ease. But, under the most favourable circumstances, there should be a spare holder ready to assist a brother in distress.

JUDGING.

This is the responsible office of the sheep show, requiring confidence, sound judgment, free from fancy, with the courage to give reasons. There is no regular rule as to where to begin to examine a sheep, but as the sheep are placed in a good light, in a row facing the judge, it is natural to commence at the most exposed part on the top, or back. This is a part where a weakness might occur, but if good on the back the sheep is worthy of further inspection. Standing at the rump, the judge will generally commence at the top of the neck, gradually opening the wool down to the junction with the body. The next move is to examine the wither, always a suspicious place, and one where most defects are found, and, if satisfied with the shape and covering of wool, the judge soon realises that he has something good in hand. In this way the whole length of the back is inspected, right on to the tail. Proceeding now from the wither in a direct line to the shoulder point, the next move may be to examine the back behind the wither, down wide of the forearm; this part giving satisfaction is a strong point in favour of the sheep. Sides are now examined, then the near flank, or that part between the hind leg and the belly, so on down the thigh, especially on to the outer thigh or britch. All the most exposed parts having been examined, the sheep

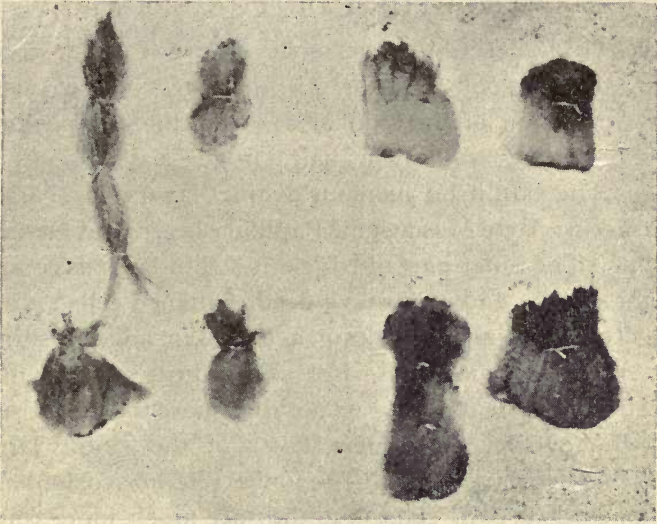
is turned up, so as to present a full view and easy access to the under parts. The folds are minutely looked into to see their form and covering, the arm or elbow receives searching scrutiny, also the brisket. A large, well-developed covering of the belly will please the judge, especially if there is a full, continuous growth, and no thinness where the belly wool is connected with that part of the body. The face, mouth, horns, and hoofs must also be satisfactory.

HOW TO OPEN WOOL WHEN EXAMINING A SHEEP.—

The great object when inspecting wool on the sheep is to open it without flattening or crushing the staples, and at the same time exposing it so as to allow a thorough inspection as to type and quantity. It has been said many times by breeders, when offering sheep for sale, that there are not many buyers that can open and inspect a sheep. It appears that the general fault is that, instead of opening with the fingers, they dig them into the fleece, flattening the staples in all directions so as to make it impossible for the wool to show in its most natural state. When opening, guard against pressure being brought to bear ; use the thumb and first and second fingers of both hands as spreaders ; this is done by gently dividing the wool, not pressing, but opening out like an umbrella, keeping the staples straight whilst laying them down. Avoid any stretching, but when the wool is open allow it to rest in its natural position, when the wool can be thoroughly inspected. After the inspection, the wool, when released, will close without showing any crushed or pressed appearance. In some positions, for instance, when examining the sides, and when standing well over the sheep, the wool is required to be opened right through from back to belly ; under these conditions the wool is laid open by the whole length of the thumbs, assisted with the first two fingers of each hand, when the wool is parted easily without crushing or pressing.

WOOL.

SPECIMENS OF THE FIRST PRODUCED AUSTRALIAN WOOL.



Parramatta, August 11th, 1804. The Reverend Mr. Marsden's observations on the breed of his flock of sheep, with the inclosed Specimens as plucked from the fleeces, humbly submitted to His Excellency the Governor for his information.

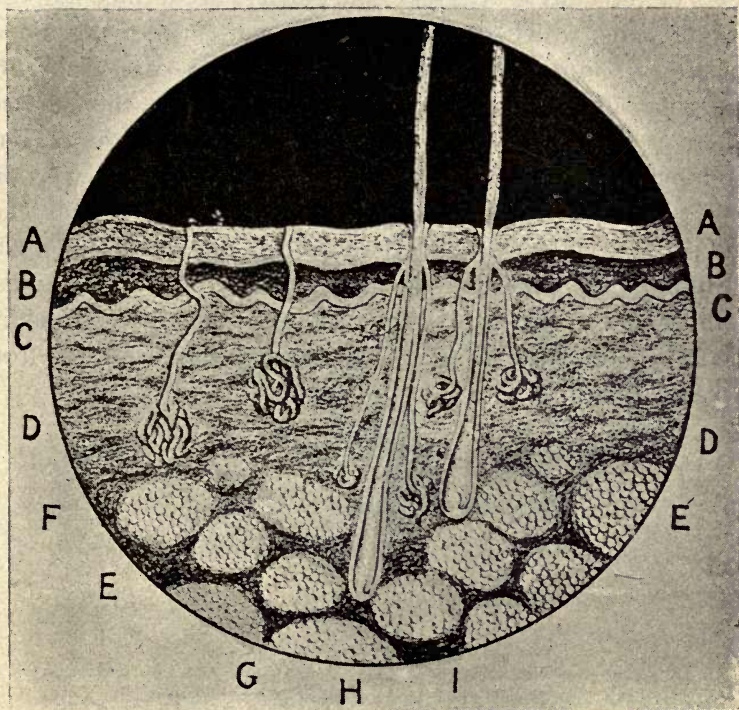
- No. 1. Hair from an Ewe, such as has been commonly imported from India and the Cape.
- No. 2. Wool from the daughter of No. 1, the father half-breed of a Spanish Ram and coarse woolled Ewe.
- No. 3. Wool two removes from No. 1, from an half-bred Spanish Ram.
- No. 4. Wool from a Ram, the produce of a Spanish Ram and coarse woolled Ewe.
- No. 5. Wool from an Ewe, the produce of another Spanish ram, bred in the Colony, and coarse woolled Ewe.
- No. 6. Wool from a male, the produce of a Spanish Ram, and an Ewe one remove from No. 1
- No. 7. Wool from a male, the produce of another Spanish Ram, and an Ewe similar to No. 3.
- No. 8. Wool from a Spanish Ram bred in the Colony.

[COPY OF ORIGINAL]

WOOL.

STRUCTURE OF THE SKIN.

BEFORE describing the mode of growth and structure of the wool fibre, it will be necessary to see the formation of the skin of a sheep, the composition of which is similar to human hair, finger nails, hoofs, and horns. The skin itself has four distinct layers, viz.: Cuticle, or scarf skin; Rete Muscosum, Papillary layer, and Dermis, or Corium. The outer part of cuticle is a thin layer as compared with the others, and consists of dead, flattened cells; this can be easily ascertained by taking a dry skin and brushing it, when a kind of dust will rise. This dust, upon a minute inspection, will be found to be nothing more than dead scales, really the cuticle, or exterior layer of the skin. Directly under this first layer, or cuticle, is the rete muscosum. This is composed also of cells, but they are much more rounded than those on the outside or surface layer. These two layers, the cuticle and rete muscosum, form what is called the epidermis. The third layer from the surface is called the papillary, or cone-like, layer, and is mostly composed of fibrous, pliable tissues, together with vessels containing a white fluid, or lymph; it is crowded with minute blood vessels, making it very sensitive. The corium, or deep-seated layer, lies undermost, and the surface of it is connected with the papillary layer by means of numberless air tissues, which collect in clusters or bundles. These tissues form a kind of network, with channels, through which the various vessels and nerves find a vent into the papillary layer, by which means the lymph is distributed. The papillary and corium layers form what is called the dermis, in which exist the globular masses, having the appearance of



SECTION OF SKIN.

A—Cuticle.

B—Rete Mucosum.

C—Papillary Layer.

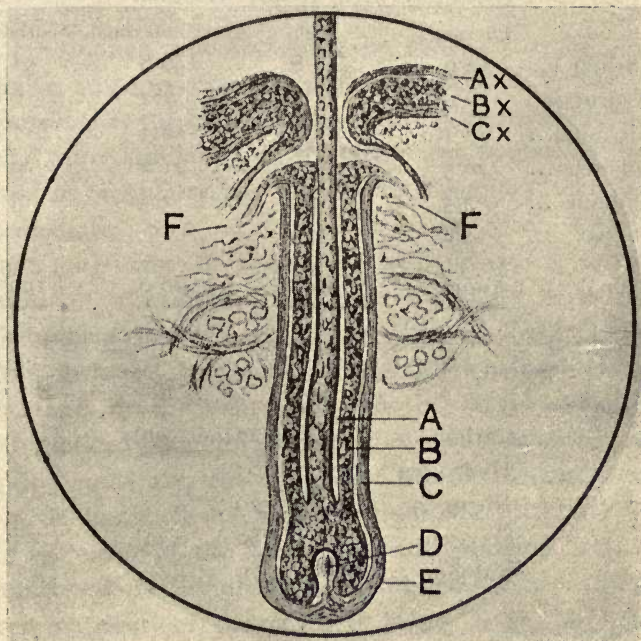
D—Corium.

E—Subcutaneous Adipose Cells. F and G—Sebaceous Glands.

H—Hair Follicles.

bunches or clusters of grapes, where the hair follicles or tubes are situated, the walls of which are formed of the same kind of cells as the epidermis, the lower portion of it containing the roots of the hair. The grape-like clusters are termed adipose, or fatty cells, which draw fat or oily matter from the blood, forming it into distinct bodies, which are carried by the sudoriparous, or sweat-producing glands, to the surface, where it is thrown off in the shape of perspiration. This is known as yolk, or sweat, and acts as a preserver and lubricator to wool fibre. The root of the fibre is thicker and softer at its lower end than in the upper end or shaft, terminating in a soft bulb, called the hair bulb. This hair bulb has a concave depression, and rests on a papilla behind the follicle, and it is in this bulb that the fibre is formed from a plastic lymph.

THE GROWTH OF WOOL.



SECTION OF HAIR FOLLICLE.

- A External transparent layer. B - Fibrous layer corresponding to
 C - Transparent Basement Membrane. Rete Mucosum.
 D - Papilla.
 E - Bulb of Follicle. F - Sebaceous Glands.
 Ax Cuticle of Skin. Bx - Rete Mucosum.
 Cx - Papillary layer.

COMPOSITION OF WOOL.

	According to			SCHERER.		MULDER.
Carbon	50'65	...	50'5
Hydrogen	7'03	...	6'8
Nitrogen	17'71	...	16'8
Oxygen	20'61	...	20'5
Sulphur	4'0	...	5'4
				<u>100'00</u>	...	<u>100'0</u>

According to DR. BOWMAN.

ENGLISH AND IRISH WOOLS.

	Lincoln.		Irish.		Northumberland.		Southdown.	
Carbon ...	52.0	...	49.8	...	50.8	...	51.3	
Hydrogen	6.9	...	7.2	...	7.2	...	6.9	
Nitrogen...	18.1		19.1	...	18.5	...	17.8	
Oxygen ...	20.3	...	19.9	...	21.2	...	20.2	
Sulphur ...	2.5	...	3.0	...	2.3	...	3.8	
Loss ...	0.2	...	1.0	...	—	...	—	
	<u>100.0</u>		<u>100.0</u>		<u>100.0</u>		<u>100.0</u>	

An analysis of Australian Merino Wool made by MR. HENRY G. SMITH, F.C.S., Technological Museum, Sydney, June, 1900 :—

Carbon	=	50.27 per cent.
Hydrogen	=	7.03 „
Nitrogen	=	16.20 „
Oxygen	=	22.80 „
Sulphur	=	3.70 „
		<u>100.00</u>

The plastic lymph, *i.e.*, a colourless animal fluid, capable of giving form, is, in the first instance, exuded through a small tube of the follicle, and in this manner the lymph is transformed, first into small grain-like particles, then into the cells, which, in the process of growth and in its passage through these cells, is elongated into fibres, forming the central structure of the hair. The cells, which afterwards form the surface or epidermis of the fibre, go through quite a different process. They are converted into something more like flat scales, entirely losing their cellular shape, and as they are formed each one overlaps its predecessor, just the same as the scales on a fish. These give rise to irregular, wavy lines seen around the surface of the sheath. Fibres take different forms, none exactly round, but appearing more or less flattened, and if the transverse section is examined it will be found that it consists of an oval shape, having a part

omitted. One of the great peculiarities observed upon inspecting a wool is that, in the very centre, the cells are largest, and as you get nearer the outer edge they gradually become smaller, and appear to be closely crowded together, or dense, so as to resemble more the bark of a tree. It has been said that the skin is composed of different layers, and so is the fibre similarly constructed, and, upon inspection, a central or medullary part (resembling marrow), a cortical, or intermediate, and a cuticle or scarf skin forming the outer part can be seen. Looking at a longitudinal section of the fibre, there are distinctly seen the same divisions, the outer sheath of dense, flattened cells or scales, followed up by a lining of closely-packed fibrous cells, and in the centre clusters of larger cells. It has been noticed that in some fibres the central cells are wanting, and are, therefore, not perfect, which has much to do with many of the malformations we often see in wool. The extremity of the fibre is mostly pointed, but, in some instances, it is divided into small filaments. The base, or lower extremity of the fibre, is larger than the shaft, and forms a knob or bulb, composed of cells, which constitute the growing part of the fibre. The largeness of the bulb is caused by, or is due to, the larger size of the newly-formed cells, which have just become detached from layers in which they were formed. As these cells are pushed forward from the bed in which they have been formed, they become smaller, and become more compact; they form the shaft of the fibre, with its various parts. The fibre makes its appearance on the skin before it has a free and independent existence. When the fibres have become independent outside or on the surface of the skin, they exhibit many degrees of fineness in the fleece of wool.

The finest wool is formed in the front part of a sheep, but it often contains much objectionable foreign matter. Commercially, the shoulders produce the finest wool, and the further you look down the flank the coarser is the wool.

This is accounted for in a rather peculiar way. All wools require a great deal of nourishment in the shape of yolk or natural fats, and it is certain that the front of a sheep produces more yolk than any other part. Now, take a piece of meat from the shoulder or breast of a lamb, that is when it is cooked. You will find that these parts contain more succulent pieces than that from the hind part. This is caused by the production of yolk, through the vital working machinery being concentrated within the chest and between the two shoulders. The heart, lungs, blood vessels, nerves, and tissues, which really mean the working machinery of all living beings, are always in motion, throwing off heat, digesting food, and reconstructing it into different forms with which to nourish the whole of the system or body. As a natural consequence of all this motion, and the working of these organs, amongst other things, there is a greater amount of moisture produced in the shape of perspiration and other greasy matters, which go to feed and nourish the wool on the shoulders, breasts, and adjoining parts more than on other parts, simply because these are further away from the place where the whole body is nourished.

All wool fibres resemble each other in structure, differing only in the smallest details, and all possess the same method of development. The fibres have three different structural parts, the first, the central medulla, having round cells, much larger than any other cells in the fibre; second, cortical substance (like bark), with angular cells; third, the cuticle (uppermost), with elongated cells, with laminated plates (scale-like). To show how numerous the cells are in the cross section of the wool fibres, they are 1500 in number, and, taking the average length of $\frac{1}{400}$ of an inch, there are no less than 600,000 in every inch of single fibre. In some fibres these cells are not so numerous, showing as low as 900 to the inch. It is curious that these three parts (the medulla, cortical, and cuticle) can all be dissected or

parted from each other. The former is more or less rounded, varying in diameter from $\frac{1}{1000}$ to $\frac{1}{2000}$ of an inch. They frequently show a distinct nucleus, and often are found to have small globules of fat, or other such matter, surrounding them. Then they become consolidated, through being pushed upwards from the bulb by the growth of the cells behind; they also contain hair. The cortical consists of a series of cells, which present uneven surfaces and are spindle-shaped, mostly flat and angular, caused by pressure. These cells vary from about $\frac{1}{300}$ to $\frac{1}{800}$ of an inch in length, and from about $\frac{1}{6000}$ to $\frac{1}{2000}$ of an inch in diameter; they contain also very minute pigment granules, not more than $\frac{1}{30000}$ of an inch in thickness, and are arranged in groups, with colour and number varying with that of the hair. The cuticle consists of isolated scales, isolated from the surface of the fibre, which are flattened, lifeless, tasteless cells, corresponding with the cuticle of the skin, and both have a common origin. Most particular attention should be given to the scales, because upon the variation of them, and the manner in which they are attached to the cortical substance underneath, depends the difference between wool and hair, and they give the felting power to the wool. Where the serrations are free, or unattached to the inner sheath, they are coated externally by a thin, membranous layer, composed of flat, imbricated scales. The scales have free margins, pointing upwards towards the unattached end of the fibre, and overlap each other, like the scales on the back of a fish. Taking hair in its natural state, these scales lie flat upon the shaft, so that it is almost impossible to see them, and their presence is indicated by the irregular transverse lines which cross the surface. By treating the hair with any reagent the free scales are raised and stand out from the stem, like scales of a fish, and, finally, become detached, so that they can be examined separately. In a high-class wool these serrations have a free margin of $\frac{2}{3}$, whilst $\frac{1}{3}$ is attached to the stem of the fibre. The cuticle of the hair is formed by

three to four layers of these cells, and they are so compact and dense that they have the appearance of a transparent membrane with serrated edges. In wool these scales are of the greatest importance, because they are the distinguishing points between wool and hair, also between the many different wools. The causes of these variations are worthy of attention, because, if we understand these causes, they assist us to modify them so as to produce a variation, which is often of the greatest value. To understand this, it is necessary to look at the manner in which the hair grows, both upon the foetal skin, and when the animal has a separate existence. In the first place, it is dependent on the selection of the sire and dam, and, secondly, on the climatic effects and other conditions by which the animal is surrounded, as well as to a great extent upon the food eaten. It has already been pointed out that the fibres at the attached end are within the follicle, which is really an involution of the epidermis itself. These follicles enclose the fibres like a sack, extending in short hairs down into the upper layer of the cutis, but in the longer hairs into its deepest portion, even, in some instances, down into the subcutaneous cellular fibre. The walls of the follicle being an involution of the epidermis, we find that these walls show a similar structure, and correspond with the layers of the epidermis. There are, therefore, three separate distinguishable parts in the follicle walls—first, an external transparent follicle layer, corresponding to the cutis of the skin; second, a much thicker, fibrous, and vascular portion, forming the greater portion of the follicle proper, which corresponds with the rete mucosum of the skin, and which, in the lower part of the bulb, comes in direct contact with the cells of the growing fibre and the papilla; third, a transparent sheath, called the basement membrane, of which the papilla seems to be an involution, and forms an interval covering of the follicle. It is composed of firm, elastic, and yellowish membrane, and terminates near the point, where the sebaceous ducts open into the hair

follicle. Externally, this membrane is connected with the outer layer of the cuticle of the hair, hence there is no interval existing between it and the hair. Upon very close examination this membrane is found to be decidedly cellular, and the cells are long and transparent, with their axis parallel to that of the hair. Their nuclei exist only in the part of the coat, are broader at the end than in the middle, and are sometimes curved and pointed. At the base of the hair follicle the inner sheath consists of a single layer of beautiful polygonal, nucleated cells, which, becoming soft, delicate, and rounded, gradually pass into the outer layers of the round cells of the bulk of the hair. The shaft of the fibre comes in close contact with the walls, or outside of the follicle, just at the junction of the cuticle and rete mucosum. At this particular part the fibre is still in a loose state, and not so compact as it is after it has passed the hard, scaly surface of the skin, the latter having a material effect upon the fineness or diameter of the fibres. The passage of the fibre through the walls, or sheath, of the follicle takes various forms through the agency of the skin ; but there are others which require more than a passing attention, and are worthy of special mention. The very different formations in a staple, or even a single fibre, are noticeable. Some have a closely-crimped fibre on the top, and lower these crimps are much wider apart, showing what is termed an irregular fibre, or fibres of two or more diameters. Heat and cold are the causes of these irregularities, and you will find that when the fibres are produced in summer they are always much coarser than those grown in cold or winter time. In hot weather the whole skin becomes relaxed and soft, and as the fibre pushes its way it can do so with great ease, therefore, it is thick and coarse. On the other hand, the cold weather has an opposite effect, the skin becomes closer, more compact, and altogether a stiffer substance, and the fibre has more difficulty in squeezing through the outlet on the surface. It must naturally follow

that the fibres produced under these circumstances must be much smaller or less in diameter than those grown when the skin is soft. Inside the enclosing walls of the sheath the cells which compose the cortical are more rounded and have larger diameters than when the hair passes out of its follicle. In the process of growing the cells are carried outwards, further from their foundations; they become less in bulk, more consolidated, and more elongated, rendering the hair shafts more dense and fibrous. In a similar way the hair cuticle undergoes a change at the root of the fibres in the bulb, where the epidermal cells are cast off from the growing points; they are round and nucleated (germination), but disappear, and become flattened and imbricated (tile-like) scales, which afterwards cover the surface of the fibre. As a rule, when the shaft of the fibre passes out of the follicle it is straight and inclined to be stiff, but possessing a remarkable degree of flexibility when stretched, as well as having power to bend or wind without injury to its cells, the cellular formation enabling it at the same time to retain its circular form when under great pressure. It is also very elastic, returning readily to its original form, or when subjected to extra strain drawing out a considerable length, like an elastic band, before it breaks. It must be noticed that the follicles do not stand perpendicular in the skin, otherwise the fibres on leaving the surface would stand erect. The natural position of the follicle is parallel, therefore the hairs lie smoothly, *i.e.*, if they are allowed to take their natural sweep round the crown, which is their natural centre of radiation. If you take the hair of any animal, a horse, for instance, it will be seen that it is arranged in various curves so as to conform with the general outline of the figure of the body. At the sides of the hair follicles, and passing into the outer layers, of which the follicles are composed, there are involuntary muscles, called erector-muscles, by means of which the hairs are drawn in an upright position when acted

upon by the nerves. The contraction of these muscles assists sebaceous glands to discharge their contents.

The rudiments of the first hairs appear in the human foetus about the end of the third month, and, just as in other mammals, are at first solid, knob-like out-growths of the stratum into the corium. In some instances the corium shows a slight elevation, preceding the formation of the rudiments of the hair; but this is absent in many instances. The rudiments of the hair, rapidly elongating, become cylindrical, the following different elements become noticeable: The majority of the cells are small and polyhedral (many-sided) in the marginal layer of the cells and the surrounding tissues. This membrane represents the rudiments of the glassy basement membrane. Each of the hair rudiments is from the earliest time surrounded by a thick layer of a tissue, altogether different from the rest of the corium, and representing the rudiments of the hair sac; it is well marked off from the corium, is composed of a network of flattened, spindle-shaped, or branched cells, and stands as a whole better than the rest of the corium; although relatively very bulky, it, nevertheless, can be traced to a thin layer similarly constituted, and situated immediately underneath the epithelium (lining membrane of cavities within the animal bodies) of the surface; that is to say, a layer which gives origin to the propelling body of the corium. The tissue of the hair sac grows much more rapidly than the hair rudiment, and having closed round the deep extremity of the latter, grows now against the papilla, and thus produces the inflection and enlargement of the bulb. Henceforth the multiplication of cells at the bulb naturally results in the new cells being pushed up in the axis of the hair rudiment towards the surface, and, becoming elongated, constitute the elements of hair substance and its cuticle inner root sheath; the cells of the primary solid cylinder represent the rudiments of the cells of the outer root sheath only. The gradual conversion of the cells of the bulb into the spindle-shaped, horny scales of the

substance of the hair, the difference at the bulb of the cell layers and their conversion into the cuticle of the hair and the inner root sheath are easily understood from the description given above of these parts of the adult hair. There is a very great peculiarity of all epidermal growths, whether it be hair, wools, nails, hoofs, or horns; they can all be greatly modified under various conditions. One of the commonest variations of wool is the wavy character, so that instead of standing upright it possesses a curly property, arising from unequal contraction of different parts of the fibre. Variation in climate is one of the causes of this character, which is one of the distinguishing features between wool and hair.

THE WOOL FIBRE.



TYPICAL WOOL FIBRE, SHOWING
SERRATIONS OR SCALES.

(See Serrations, page 281.)

This subject takes a wide range, and to make it as interesting as possible and at the same time equally instructive, it would be necessary to give a series of articles. This is the first instalment wool, and its relationship to its very near relative, hair. What is a wool fibre? This appears to be a very simple question, especially amongst those who grow, sell, and otherwise are closely connected with the wool trade generally. In the great majority of answers wool is described as the covering of a sheep. Technically speaking, this is incorrect, because in a great many instances sheep produce kemps, and even hair, which are altogether different, both in their internal and external structure, and cannot be classified

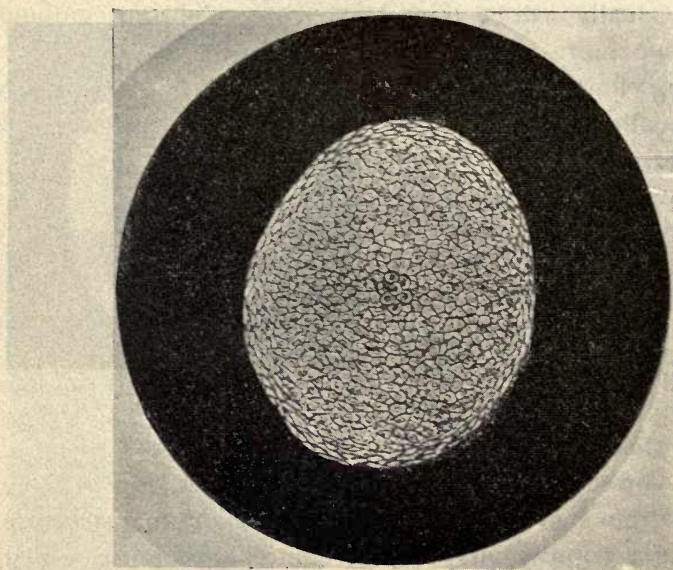
with wool. Also, the covering of sheep which are allowed to run wild has a tendency to and will actually revert to hair, which is supposed to be the original produce of sheep before they were domesticated. To further prove that all sheep do not produce wool, we must follow them into Asia Minor, where all the sheep grow a decided hair. This is simply due to a climatic influence, and however beautifully and perfectly woolled a sheep may be, if transported to that part, its fleece gradually will be transformed into hair. As a hair-producing climate Asia Minor is not equalled by any other in the world, and we have only to look at the excellent texture and brilliancy of the lustre of the mohair grown there to verify this statement. It will thus be seen that the term wool requires a different definition from calling it the covering of a sheep.



CROSS SECTION OF THE WOOL (MERINO) FIBRE, SHOWING CELLULAR FORMATION.

The correct answer is : Wool is a modified form of hair, differing from hair both in its external and internal structure by having a crimpy, curvy, or corrugated appearance, whilst the internal formation is composed of numerous minute cells. Hair, on the other hand, has a comparatively smooth surface, whilst the few cells there are are elongated and contain marrow, and will not stretch, but break off brittle, and will curl or harle. These crimps and cells in wool give it an elastic and pliable property, and make the difference between hair and wool. Take, for instance, a single fibre of wool and stretch it. Upon examination it will be found that it becomes gradually smaller and smaller, just the same as stretching a piece of elastic, and, if a true wool, it will return readily to its original form when released. If too much tension is applied, so as to break the fibre, it will be

seen that where the fracture occurred the diameter of the fibre has been greatly reduced, and the ends stand out straight. This elastic property, which makes wool so valuable, may be attributed rightly to the presence of crimps and cells in the fibre. Not so with hair, as its formation is different, being almost devoid of both cells and crimps. If we put hair to the



CROSS SECTION OF THE LINCOLN WOOL FIBRE.

same test as wool the result is altogether different, as, if tension is applied, we find that hair is stiff, hard, and will not give, but break off short and brittle ; when the two broken ends are harled or curled, it will be the same thickness as the hair before the testing. Thus, it will be seen that the wool can be distinguished from hair, first, by appearance ; second, by testing.

YOLK.

When the fibre becomes independent of the pelt it pushes its way through a greasy matter called yolk, which is secreted by the skin. This yolk acts an important part in wool-growing, and varies in quality and quantity in different breeds, merino producing the most. Although of a greasy or fatty nature, it differs from all other fatty matters, being composed mostly of potash, and will dissolve in water, and even absorb half its own weight of water. When yolk is mixed with water, two parts to one, the substance is thick and stiff, and is of a pale brown colour, without showing the least trace of water, and if put into an air-tight vessel will remain the same for years. Yolk is found in all breeds of sheep, varying in both quality and quantity; it even varies in different portions of the same sheep. It is found in greatest quantities in the front half of the sheep, and through its agency the wool here is found to be the soundest. Yolk also forms a protective covering of the wool in resisting wet, thus assisting the growth, and rendering the chance of damage less when it is left in the fleece. It acts as a preservative to the fibre, making it soft, pliant, and, when in a healthy state, lends a silky touch. During growth the yolk prevents all possibility of the fibres becoming entangled, which they would do if there was any defective supply of this greasy matter, which further assists the fibres, as it were, to glide over each other, giving it that freedom so much valued by manufacturers. The constitution of the yolk varies, rendering it capable of cultivation. When this greasy matter is in a healthy state it may be white, light brown, or dark brown, and if of a free nature, and not any way sticky or pasty, the wool derives nourishment, the whole growth is encouraged, and greatly benefited. One objectionable class of yolk is, that pasty or sticky kind, which appears on the fibres in small particles. Such yolk has a tendency to interfere with the length, keeping it stunted, but giving appearance of density, and adds to the weight of the wool. This increased weight is

not altogether real from a yielding point, as when the wool has undergone the process of scouring, which all wool has to do previous to manipulation by the manufacturer, will lose the extra coating of pasty yolk or surplus weight. The difference in loss of yolk is great when you deal with an average clip of merino, and one of an extra fatty nature. The former will lose about 20 to 25 per cent., and the latter 45 to 60 per cent. (exclusive of dirt) when both are thoroughly cleaned. There is also a good amount of risk in these sappy merinos in an adverse season, especially a wet one. Much water in a continuous wet season falling on wool on the sheep naturally settles in the fleece, and when it comes in contact with the heavy yolk for any length of time, the latter is hardened, and so both yolk and wool deteriorate in quality and yield. Under these circumstances the yolk sickens, becoming diseased, forming itself into a hard mass, causing the wool to be discoloured, varying according to the state of decomposition from a light pink to a dark green. This colour cannot be removed by scouring, therefore causing a great depreciation in value, besides injury to the sheep. In a dry, dusty season also this sap in the wool is in danger of becoming seriously damaged by the dust settling down into the wool and coming in contact with the yolk. Thus both form an additional risk by sticking to the wool, when it becomes dust-stained, and during scouring such severe measures have to be resorted to in order to remove the sticky dirt that, when it comes out of the ordeal, the wool is damaged, being hard and harsh, the pliability and, moreover, the softness being destroyed, and there is never a bright colour. The wool is thus made an inferior manufacturing article, and of little use except for inferior goods. A healthy, free flow of yolk will benefit greatly and encourage the growth of any class of wool, and is one of the chief factors in wool-growing. Commercially, yolk is of considerable value, being in demand for making lanoline and toilet soaps. Lanoline is a medical fat, manufactured from

the natural fat or yolk of sheep's wool. By chemical treatment of the yolk an exceedingly pure fat can be obtained.

The yolk in its natural state is heated with soda lyes, in order to saponify the fatty acids. The soap so formed turns the yolk into an emulsion, which, when diluted with water, forms the so-called wool milk.

If this wool milk is subjected to centrifugation it separates like cow's milk, into a cream and a thin milk. The creamy portion is treated with lime salts, whereby a precipitate is formed, known by the name of crude lanoline. When heat is applied to the crude lanoline it is separated into its constituent parts, fat and water. The fat thus obtained is treated by a patented method, which frees it from all wax-like substances, and anhydride of lanoline is the result.

The anhydride is mixed with 30 per cent. of water, and thereby transformed into pure lanoline.

A FLEECE OF WOOL.

To be correct, a fleece of wool is "the woolly covering of a sheep, taken or cut off in one piece, and is composed of staples of wool held together by binders." The dictionary tells us that a fleece of wool is the covering of a sheep. Taking this answer in a broad sense it is right, as it is acknowledged generally that sheep give that beautiful, soft, elastic fibre called wool. Technically speaking, exception may be taken to that definition, as very many sheep produce wool, hair, kemps, and gare in their covering, and as all those are hairs—each one differing from the other in its physical structure—the latter three certainly cannot be called wool. The construction varying both internally and externally, the colour must also vary a little; therefore the proper answer is as before given. Again, if sheep are neglected and allowed to run wild, however highly cultivated they might have been at one time, their fleece, or covering, will gradually but

surely become hair. This certainly cannot be properly called a fleece of wool, although it was grown on a sheep. Take another argument : Climate has much more effect upon sheep and their covering than is generally understood. Place, for instance, one of our highly-improved merino sheep in Asia Minor or Turkey in Europe, the wool will, by degrees, be changed into a perfect lustrous hair, the beautiful, bright, soft, pliable fleece it once gave us will now be replaced by a hairy coat which could not be accepted as a fleece of wool.

The natural growth of a fleece is twelve months, and if allowed a longer time it will gradually deteriorate in texture, colour, and condition.

TIPS, OR EXTERIOR FORMATION OF STAPLE.

STUD SHEEP.

Tips alter in formation according to exposure to the weather and the mode of feeding. These figures are taken from sheep which have been highly fed and carefully sheltered, and in such instances the quality of wool is indicated with tolerable accuracy through the formation of the tips. The ends of the strands, or tips, are connected into larger and smaller bodies by the quality and action of the yolk, and correspond to the folds of the skin and the action of the body. According to the different sizes of those folds and actions already mentioned, the small-bodied or smaller-shaped staple, or the large-shaped staple, is formed. The small-formed tip is the most perfect, as it seems only to occur with the cylindrical form of the strand, and, as a natural consequence, necessitates a dense growth of a very perfect and fine wool fibre.

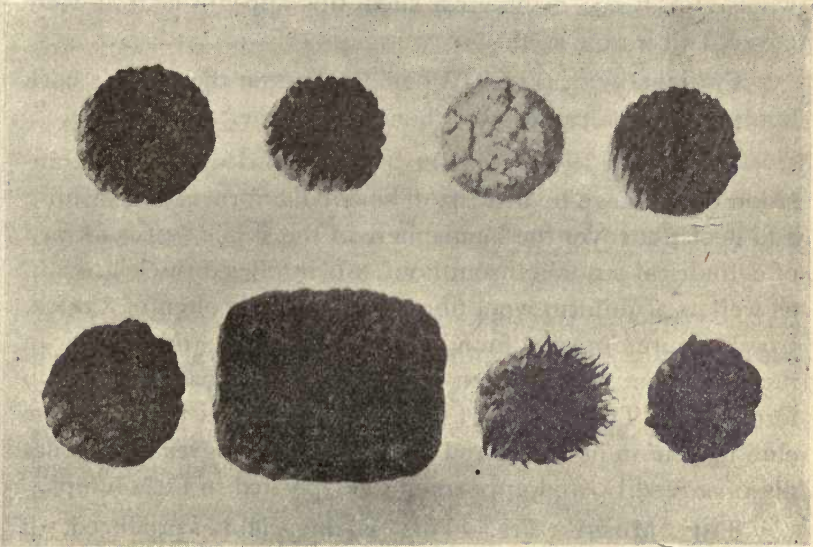
PEARL TIP.—This is found only in the very superior merinos, such as the finest Mudgee, Tasmanian, and Saxony. It appears in the shape of small heads, which do not exceed

PEARL.

RAPE SEED.

CAULIFLOWER.

BLUNT.



MOSSY.

CLUB.

POINTED.

ROUND OR LARGE
FORMED.

TIPS OR EXTERIOR FORMATION OF STAPLES.

the form of hemispheres. The form of the staples is always cylindrical, and is determined by the very small groups of fibres.

RAPE SEED TIP.—This is very little removed in value from the former, and indicates a slightly larger staple. This form of tip is also a special peculiarity of superfine wools. A fleece displaying such tips appears as if it were covered with rape seed.

CAULIFLOWER TIP.—When washed on the sheep's back it appears like a cauliflower, hence the name.

BLUNT OR FLAT-FORMED TIP.—This forms the transition of the large-bodied tip. The circular form is diminishing and does not cover the hemisphere of the staple, but is formed of cylindrical strands throughout. It implies a thick growth, as well as a uniform wool fibre. The yolk is often of a thick, pasty nature, mostly found in the Negretti and American races. It is faulty when the staple approaches a club formation. The density of the wool decreases the more the club formation of the strand increases. The grease does not dissolve readily, and appears to be deposited in little lumps.

THE MOSSY TIP.—This is invariably produced, if necessary care is not bestowed, when the sheep are constantly exposed to all weathers. The thick, gluey grease causes the tips of the staples to adhere together, then it runs, and gives the surface of the staples a mossy appearance. In some cases the strands completely separate at the ends, and the staple appears partially dissolved. But often, in spite of all this faulty appearance on the exterior, the inner formation of the staple may still retain its natural condition.

THE CLUB TIP.—The tops of the staples are matted together to a certain depth down the inner staple; the surface also is covered with thick, pasty yolk. All the single staples of the whole fleece are so strongly glued together that they will separate from one another only by the movement of the body. Pressing the hand upon the wool gives the same

sensation as if a board is being touched, and the wool can only be opened by using a little force. Such wool loses much weight in scouring, and gives a great percentage of noil when combed.

POINTED TIP.—This style of tip is very objectionable, indicates thinness, and the wool is always strongly marked. The yolk is mostly of a thick nature, penetrates into the wool, and sticks the thin single strands together, causing them to become pointed. To this may be added a want of uniformity of the wool fibre as it passes into the thread, and the single strands are wound into long, spiral-formed, twisted points. Indifferent care and climatic influences act most ruinously upon this form, because the rain and dust can penetrate deeply into the wool, making it of very little value.

ROUND TIP, OR LARGE-FORMED TIP.—This is without fault, except when the single staples are formed cylindrically, the wool fibres are equal to the ends, and are of equal length. Subjected to these conditions, the wool appears rounded in its surface, hence the name.

TIPS OF FLOCK SHEEP.—In flock sheep the exterior of the fleece is subjected to more varied climatic conditions than the stud sheep, the former having no protection from the weather, simply roaming about in all seasons, whilst the latter are protected, and this altogether alters the outward appearance of the fleece. These variations of season alter the tips of the staples according to the length, density, and quality of the wool. If a proper selection is made of the type of the sheep suitable to the country, then the exterior does not suffer to such an extent; but, if there is any neglect in this important matter, then both the exterior and interior of the fleece will most certainly be disadvantageously affected. In the Riverina district we expect to see a rather open and mushy tip, even among the deep-grown merino wools, a type suited to that district. But, if it is a fine

combing wool, at all inclined to be a little open or wanting in density, then the whole fleece suffers, the tips will be of a thin, wasty character, extended well down the staple, the formation being one of the most objectionable. Out West, on the open, exposed plains, where there is much dust and no protection from the sun, the fine wools will come out even worse than in Riverina. The whole extent of the Eastern Division produces a different tip in different districts, according to their varied temperatures.

LEVEL OR SQUARE TIP.—This is the most perfect tip an unhoused sheep can have. In this form the tips cover the same area as the staples, showing closeness and compactness, and should be found in breeding ewes. The level tip indicates density and body, and is a sure sign of a sound, compact growth, the result of good, careful selecting, or classing of sheep.

MIXED TIP.—This kind is a mixture of yolky and dry tips. The ends show slightly wasty or mushy, intermixed with a few heads of yolk. The climate has not injured them to a great extent, through the presence of yolk. Such wool carrying the mixed tip is generally found from the middle to the southern parts of Liverpool Plains.

TIPPY.—A wool with a superabundance of tip; also a very heavy, yolky tip, is called tippy.

THIN TIP.—When a staple is fine down, or becomes smaller towards the end: The wool may be of high quality, and in a healthy state, and have a small black, yolky head. In breeding, such wool-producing sheep should not be encouraged, as it is an indication of want of body, or compactness, and under adverse conditions the wool will become light and feathery.

FUZZY OR NOILY TIPS.—This is a very large-headed tip, the openness or fuzziness appearing quite out of proportion to the staple, even in a shafty wool. The sun having dried up the yolk as it rises to the extremity of the

staple, causes the fibres to perish, when the ends split and spread. The splitting of the ends of the fibres makes the tips much larger or more out of proportion, or tip-heavy, on account of the many ends caused by splitting. In a shafty wool these large, fuzzy tips are combed out by the combing machine, still leaving a nice length of the sound wool; but in a medium or shorter wool the damage is more severe, causing a depreciation in the value and a general inadaptability of the wool for the better class of manufacturing purposes.

LOCKY TIP.—The tip is very thin, the staples being mostly small-bodied, and in the wool generally there is a great want of density. Under such conditions the wool is open, allowing the sun every opportunity of withering up the small staple, often half-way down. Wet will also cause a locky tip, causing the defect even to a greater extent than in a dry season.

A STAPLE OF WOOL.—Means that a great number of fibres form themselves into natural bodies or clusters during growth. These staples show the length of the wool by which the buyer readily makes his selection for his requirements. Staples take a great variety of forms.

BINDERS.—Are the fibres connecting the staples so as to form a piece or fleece of wool. These binders play an important part in connection with wool, and, according to their position on the staples, so, approximately, the age of a sheep, from which the fleece was cut, can be told.

In a hogget wool these binders are connected with the curly end of the staple, and as it is being drawn the binders are distinctly seen clinging to the tip. In the course of drawing out the staple the binders become separated from it, although they are the same length as the staple.

The succeeding year these binders have no connection with the tip, but are connected with the staple a little lower down. In the following year the binders will be attached about half-way down the staple, and as the sheep advance in

age these binders are connected near the base of the staple. When the sheep is over age the staple can be drawn out almost independently or free of binders.

CLEAMERS.—The name given to small, fatty, dirty, short, thin locks of wool found on fleeces. When found on fleeces it is a clear indication of neglect on the part of the sweeper of the shearing board in not keeping a clean floor where the shearer operates. After a shearer has divested the sheep of its fleece there is always a little trimming required, when all the small, dirty locks formed on the inside of the hind and fore legs and brisket have to be clipped off or removed. If these are allowed to remain on the shearing board, and not swept up as they should be, they find their way into the next fleece, and, being fatty and sticky, naturally cling to the wool. Another cause is the result of indifference displayed by many gentlemen in charge of the shearing board, by allowing the shearer to stand on the fleece whilst he is trimming the sheep, when all these short, fatty locks fall on to the fleece. To keep the fleeces free from cleamers it is necessary to keep a clean floor, and to pick up the fleece and take it away before the shearer commences to trim his sheep.

Frequently cleamers are found in clean, scoured fleece wool, which show out prominently, being of a yellow and greenish colour. When present, buyers take exception to them ; therefore the value of the clean wool suffers.

A COMBING WOOL—A wool which can be combed. Technically speaking, this is the only answer that can be given, although in the trade generally it would be looked upon as insufficient to convey the proper meaning. Through the great improvements of the last 20 years in the combing machines, wools of all lengths can be combed ; even noils combed out of Lincoln wools have been combed over again, and yielded a fairly good top. Under these circumstances the above answer will cover all technicalities, and will be quite correct to quote.

Formerly only the deep-grown English wools, such as the Lincoln, Leicester, Cotswold, etc., were considered combings, which, from their lengthy staples, were alone capable of passing through the combing machines. A few years later further improvements in machinery were introduced with the view to comb wool of shorter growth or length, which were most successful, causing a revolution in that part of the manufacturing. At the present time there are machines capable of combing wool, however short. It may be said that the manufacturers when manipulating wool in its early stages of manufacture really determine what is a combing wool. However, to us in this great wool-growing country, where it is prepared for the market and not for the manufacturer, something more definite is required than "a wool which can be combed." We understand when the term combing is used that there must be some distinction between it and a clothing. That great distinguishing point is in the length, the longer wool of a clip being a combing, and the shorter the clothing. There is no hard and fast rule as to the length of combing; the thumb rule is an old-fashioned method in deciding between a combing and a clothing. Formerly it was occasionally seen, and is now, on some stations, that the wool-classer measured, and measures, the wool by the aid of his thumb. Any sufficiently long to reach from the tip of his thumb to the first joint he puts into his combing; any not coming up to that standard goes into the clothing. There are other points to be considered besides length in the various types of combing wools, and, as in all other wool properties, the differences are in degrees. For a typical combing, the wool must have a fair length, be particularly sound, with freedom, elasticity, as free as possible from noil, in the shape of a mushy, cloudy, or kind of crossed or interwoven growth, and should have a good, bright colour.

Taking the other extreme, an undesirable type of combing is anything hard, stiff, or unyielding, inclined to

tenderness, mushy, fuzzy, open, wanting in body, with fibres intermixed, crossed so as not to pass through the minute steel teeth of the combs freely ; also of an indifferent colour. A manufacturer avoids this class of combing, as it does not come within his idea as a wool adapted for that process, except for inferior purposes, for making a cheap, low class of goods.

TOP—The name given to wool after it has undergone the process of combing, when all the noils, knots, and moits are combed out or removed, afterwards taking the form of a ribbon or sliver, and rolled into a large ball of pure wool. In this form all the loose, mushy, downy, faulty fibres have been removed by the delicate steel teeth of the combs, leaving but one long ribbon of pure wool, with all the fibres lying free and parallel, ready for further manufacturing stages.

SLIVER.—Is a manufacturers' term, given to a wool after it has passed through the combing machine, when all the weak, mushy, perished fibres, together with moits, are combed out, leaving a long, ribbon-like form of combed wool, which is called sliver. Sliver also applies to a clothing wool, after it has passed through the carding machine, when it takes the name of sliver, or a carded sliver. In this state the sliver has a mixed or entangled appearance, and, although the fibres have been greatly reduced in length in the carding process, they cling together, forming a lengthy, cloudy-looking ribbon or sliver of wool.

NOILS.—Are all the weak, downy, mushy, or faulty, knotted fibres, together with any moits, combed out by the combing process. Although noils consist of faulty wools, they are of considerable value, according to their quality and condition, and are used in the woollen trade, especially for hosiery and for making flannel, and, if of low quality, for low blankets, rugs, etc.

A CLOTHING WOOL.—A short wool, a distinguishing name from combing, or a wool better adapted for the carding than the combing process. There are a great many varieties of clothing wool, each having its own special adaptability for making the great many different kinds of fabrics coming within the range of the woollen manufactures. Fine cloths, such as broad, officers, billiard, and livery, all require a much higher class wool than a carpet, rug, or blanket. In the former cloths it is imperatively necessary that the wools should have the very best felting properties, as well as fineness, whilst for the latter short wool of most inferior quality, and without any felting properties, is used. A high-class clothing wool will be short, in a truly-bred wool it is very short, with a very closely-crimped fibre, showing out distinctly and true throughout; these generally indicate the presence of serrations, which, together with elasticity, give the felting power; there must be a healthy, compact growth, free, kind, soft, silky, and having a good, bright colour, so as to take the dye, thus imparting a glossy appearance. A low class of clothing wool will be straight or plain, wanting in crimp, hard, and is unyielding, denoting a deficiency in felting qualities, which are not required in low woollen goods.

QUALITY.

QUALITY.—Implies that the wool, having all the characteristic wool properties best developed, possesses the most quality, viz., soundness, character, trueness in the fibre, evenness in its formation from bottom to top, elasticity, pliability, fineness for its breed, crimpy structure, colour, softness, freedom of growth, density of fibre, density of growth, body, draught, and silkiness. Whenever any of the above-named properties are imperfect or deficient, then there is a want of quality. Quality applies to all the pure-bred wools, and not to merino alone. It is often argued that quality relates to fineness alone. This is a great mistake, because a merino wool can be over fine, when the fibre will be found to be delicately fine, effeminate, tending to unsound-

ness, with an almost straight formation, the crimps scarcely distinguishable, or almost bred out. To such wools the term quality cannot be applied, the extreme fineness being its only quality; all the other properties will be found to be deficient. Let us now look at the massive, coarse Lincoln wool. Who could conscientiously say that that type of wool could not possess quality, simply because it is our strongest wool? The same argument holds good in reference to our strong merino, and he would be a bold judge who would tell the breeder that there was no quality in his wool, simply because it is of a strong type. All pure breeds of sheep can, and do, produce wool of quality, according to their breed. Every breed has its own wool characteristics, to which, when properly developed, the term quality can be correctly applied.

COUNTS OR SPINNING QUALITIES.—As many hanks of 560 yards as can be spun from 1lb. of scoured wool represents the spinning quality or counts of that wool. For example: A hank of yarn, or 560 yards of yarn, would represent a 1's spinning count or quality. Sixty times 560 yards would represent the spinning count of 60's.

WHAT IS A 60's MERINO?

Of all the different qualities the 60's are the most frequently quoted, which really serve as a guide to the value of merino wools. In describing a 60's merino top, it is most requisite to know what kind of combing wools are used in their production. The wool is not by any means fine, but of the medium to strong class, with a good, full, bold, lengthy staple, generally about three to four inches long; free, sound, soft, and bright. Such a wool would make a super 60's, so often quoted from Bradford. The flocks known to produce this style of wool are the Wanganella, Boonooke, Uardry, Quaimong, Yarrawin, Collaroy, Springfield (Goulburn), Haddon Rig, Gingie, etc. A common 60's is made from wool much of the same quality as super 60's, but not so free from moits or as good in colour.

COMPARISONS OF THE AUSTRALASIAN MERINO WOOLS AND THE COUNTS TO WHICH THEY CAN BE SPUN.

	TASMANIA.	VICTORIA.	N.S. WALES, FINE, MUDGEE, NEW ENG- LAND, YOUNG.	N.S. WALES, MEDIUM, STRONG MERINO.	QUEENS- LAND.	SOUTH AUSTRALIA.	WEST AUSTRALIA.	COUNTS.
1	Extra fine	...	...	...	...	...	...	160's
2	Super fine	Extra fine	Extra fine	...	...	...	...	140's
3	Fine	Super fine	Super fine	...	...	...	...	130's
4	Average	Fine	Fine	...	...	...	...	120's
5	Medium	Average	Average	...	...	...	...	110's
6	Strong	Medium	Medium	...	...	...	...	90's
7	V'ry strong	Strong	Strong	Extra fine	Extra fine	...	...	84's
8	...	V'ry strong	V'ry strong	Super fine	Super fine	Extra fine	Extra fine	80's
9	...	...	...	Fine	Fine	Super fine	Super fine	74's
10	...	...	...	Average	Average	Fine	Fine	70's
11	...	...	...	Medium	Medium	Average	Average	60's
12	...	...	...	Strong	Strong	Medium	Medium	56's
13	...	...	...	V'ry strong	V'ry strong	Strong	Strong	50's
14	...	...	...	...	...	V'ry strong	V'ry strong	46's

COMPARISONS OF DIFFERENT CLASSES OF ENGLISH WOOLS AND THE COUNTS TO
WHICH THEY CAN BE SPUN.

WOOL.

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	SOUTHDOWN TEGS.	SHEREPSHIRE DOWN TEGS.	DORSET HORN TEGS.	HAMPSHIRE DOWNS TEGS.	CHEVIOT, ROMNEY, BORDER LEICESTER, &c.	COTSWOLD AND MIDDLE COUNTIES.	LEICESTER.	LINCOLN.	EGYPTIAN.	EAST INDIA.	COUNTS.
1	Extra fine	...	...	...	...	...	...	...	...	...	56's
2	Super fine	Extra fine	Extra fine	Extra fine	...	...	...	...	...	...	54's
3	Fine	Super fine	Super fine	Super fine	...	...	...	...	...	...	52's
4	Average	Fine	Fine	Fine	Extra fine	...	...	...	...	...	50's
5	Medium	Average	Average	Average	Super fine	...	...	...	...	...	48's
6	Strong	Medium	Medium	Medium	Fine	Extra fine	...	...	...	...	46's
7	Britch	Strong	Strong	Strong	Average	Super fine	...	...	...	...	44's
8	...	Britch	Britch	Britch	Medium	Fine	...	...	...	...	42's
9	...	...	...	...	Strong	Average	Extra fine	Extra fine	...	...	40's
10	...	...	...	...	Britch	Medium	Super fine	Super fine	Extra fine	Extra fine	36's
11	...	...	...	...	...	Strong	Fine	Average	Super fine	Super fine	34's
12	...	...	...	...	...	Britch	Medium	Medium	Fine	Fine	32's
13	...	...	...	...	...	...	Strong	Strong	Medium	Medium	30's
14	...	...	...	...	...	...	Britch	Britch	Strong	Strong	28's
15	...	...	...	...	...	...	Cow tail	Low Britch	Britch	Britch	26's
16	...	...	...	...	...	...	..	Cow tail	Low Britch	Coarse	24's
17	...	...	...	...	...	...	...	...	...	Very coarse	22's
18	...	...	...	...	...	...	...	...	...	Extra coarse	20's to 8's

CHARACTER—Signifies that the wool possesses strongly-marked distinctive qualities of its breed. Usually this term is applied to wool having a distinct, crimpy structure, that only wools of that formation have. But the real meaning must go much further than that, as some wools are beautifully crimped or curved, but have nothing else to commend them as a high-class wool. Every breed of sheep has different characteristics in their wool, by which they are distinguished from each other. A characteristic merino wool is known by its fineness compared to all other breeds, but must also have a greater number of curves in a given space; it is also necessary to be elastic, pliable, soft, and of a bright, not lustrous, colour. Such are the properties expected to be found in a merino wool, to which the term character can be applied. Other breeds have their own special characteristics—for instance, take the other extreme case of our strongest wool, the Lincoln. A Lincoln wool possesses a lengthy, full, bold, massive staple, with a few curves, about three to five to the inch, and of an undulating or slightly wavy formation, with a brilliant, glossy, or lustrous appearance; the fibres appear plain or straight, yet of a silky texture, all of which are characteristic of a Lincoln wool. Character, when rightly applied, may be said to indicate quality, to which it is closely allied.

FINENESS.—That wool fibre having the smallest diameter is the finest, thinnest, or smallest. Fineness is a relative quality, and we speak of fine wool only in comparison with wools of a thicker or larger diameter. Fine and coarse have the two extreme opposite meanings, and are used when describing or contrasting the many varieties of wool. Coarse is used as a depreciative term, whereas fineness points out the higher quality of the wool. Manufacturers, wool merchants, wool buyers, and wool sorters mostly possess the ability to distinguish the degrees of graduation of the finest or coarsest without the assistance of artificial means. Many authorities contend that this distinguishing power is a special

gift, but reasonable intelligence, combined with constant practice, will greatly assist to improve the ability to decide the degrees of fineness. In former times there was a greater distinction in the different qualities, which were confined to two sorts, fine, and strong or coarse ; now the graduations are more numerous, and more difficult to define, the result of the cultivation of so many intermediate breeds of sheep. The degrees of fineness vary imperceptibly, and may be contrasted with the gradual change from daylight to dark.

SOUNDNESS OR STRENGTH.—When a wool will stand a reasonable amount of tension, or strain, without showing signs of weakness, it is said to be sound. This is one of the most valuable wool properties, for without soundness there will be a general deficiency in its other characteristics. For a sheep to produce a sound wool it must have been in a perfect state of health during the natural 12 months' growth, and must have had regular and sufficient food and water. When submitted to tension, the wool fibre exhibits a great amount of strain, and when broken the fracture takes place at the junction of the scales or serrations which are pulled out at their bases. The scales themselves are broken.

CRIMPY OR CURVY—Implies that the fibres have a crimpy or curvy formation, and this is one of the principal peculiarities of merino wool-fibres ; these crimps or curves are placed transversely across the fibre, and are true indications of quality. They assist also to impart that elastic property to merino wool, which is far in excess of that possessed by any other class or breed. In a superior merino wool there are 24 to 30 crimps to the inch, and sometimes more. Fine, 20 to 24 ; medium, 16 to 20 ; strong, 12 to 16. In the English breeds the South Down, which is the finest, contains 14 to 18 crimps to the inch ; medium, 11 to 14 ; and Lincoln, 3 to 5. These crimps take different shapes or forms,



CRIMPS
OR
CURVES.

and, accordingly, wool is judged to a very great extent by their formation and number in a given space. The crimps are never spiral, but undulating, which in the merino is an especial feature—the finer the wool, the more numerous these minute waves or crimps are, and when they are even, true and distinct, indicate character and breeding also. Though the crimps of a single wool-fibre are not so regular as when in the strand or staple, yet they are of the same nature in the same fibre. When the single curve is in the form of a half-circle—*i.e.*, when the height of the curve is equal to half its diameter—this formation indicates all superior, well-bred wools.

NARROW CRIMPED.—When the height of the crimp is much higher than its diameter. This is not a desirable form for manufacturing purposes, being inclined to be curly, making it difficult to spin.

FLAT CRIMPED.—The height of the crimp here is less than one-half of its diameter, making the structure more undulating.

OVER CRIMPED.—In this formation the single crimp is almost circular.

EXTENDED CRIMP.—The term given when the crimps take a more undulating form than the flat-crimped fibre.

PLAIN CRIMPED.—In this class the crimps are so undulating as to be scarcely discernible. This formation is seldom found in merinos, but mostly appears in the English wools.

SMOOTH OR FLAT CRIMPED.—A term used when the curves do not come up to the form of half-circle. Having great uniformity and trueness, the curves unite closely together. The staple is always cylindrical in form, and mostly of great strength and lustre. The yolk is less in quality, thin and clear. The smooth form of staple is best among the flat serrated wools, and is mostly found on combing wools.

WISTENED OR FLAT CURVE.—Such are wools whose curves do not reach the form of the half-circle. It is generally the case that when the form of staple is cylindrical the wool fibres always exhibit a very dense growth, as well as great strength and uniformity. The form of the staple is always large bodied.

CLEAR.—The staple is called clear when the structure of a perfect wool fibre is even, true and uniform, and the curves of the same are distinct and easily recognisable. The form of each crimp or curve is still normal, and although they are uniform they are found to be much closer than in the watery type. The union of the several strands is not so intimate, and the form of each crimp or curve stands out clearly. The staple is cylindrical in shape, the growth of the fibres very close upon the skin, and of equal length and strength. The staple is small bodied, and the wool of great value.

ELASTICITY.—Elasticity implies that a wool will stretch or extend, and when released will return readily to its former or natural state. This is one of the special features in a true wool, which is accounted for by its external or curvy formation, and the internal or cellular structure. When tension is applied to wool, the curves are straightened out, giving it its natural length, and, by continuing the tension, the glutinous spindle-shaped cells are stretched also, which, together with the curves, give the wool its elasticity, which is one of the most distinguishing points between wool and hair. If too much tension is applied, the cells are fractured, and then the elastic property is destroyed, and the wool takes a permanent set. It is also understood that moisture in the shape of yolk has a certain amount of influence on strength and elasticity.

FLEXIBILITY OR PLIABILITY.—A term used to imply suppleness, or a wool that is easily bent or will give. This term is closely allied to elasticity, the difference being that it possesses, besides its elastic properties, that of yielding and

bending readily ; in other words, is more supple. It is very noticeable that some wools have elasticity, but have not that softness or silkiness found in other classes. This difference might be caused through want of a proper healthy yolk supply ; and it is wanting in some breeds of imported merino, the result of too much pampering, housing, and artificial feeding. Pliability is a most important feature in the spinning and weaving processes, whether for the manufacturing of fabrics made from combing wool or woollen cloths made from shorter wools. Pliability is also a very necessary quality for felting purposes, the elasticity and suppleness making the wool entangle or cling together more readily than a wool of a stiffer and harder nature ; therefore, its great value for manufacturing purposes.

SOFTNESS.—A wool kind to the touch, smooth and yielding is called soft. This is one of the most valuable qualities of wool, principally a climatic effect, found mostly among sheep grazing on pastures situated on elevated country, where the air is free and bracing. Under these conditions, there is a good supply of free yolk, which imparts a kind, silky feel.

COLOUR.—When speaking of the colour of wool, we imply brightness. Among wool characteristics, colour is one of the most important factors, and brightness must be considered as the predominating feature of colour in wools generally. There is no other property varies so imperceptibly as colour, not even the degrees of fineness. Even the wool of a single sheep when scoured gives a great many different shades. Different breeds of sheep produce a variety of brightness, a colour from the most brilliant lustre down to the chalky white, whilst the faulty colours are equally numerous. The original colour was black, which is the predominating colour of wild animals, and many by domestication have changed into white and bright, with their numerous graduating shades.

TRUENESS—Applies to the structure of the fibre. That having the same diameter throughout, the crimps or curves uniform in shape and evenly set apart throughout the whole length, is said to be true.

EVENNESS.—Relates rather to the whole covering or fleece than to the formation of the single fibre. A fleece might not be of high-class quality, but if it be uniform, whatever the type may be, it is called even. In the sheep judging ring there is great consideration given to evenness of covering, as the same type of wool is expected to be found on one sheep. It must not be taken for granted that a sheep produces exactly the same quality in every part. The finest wool grows on the shoulders, and the lowest or coarsest on the britch; and when considering evenness in one fleece, the term is used in a comparative sense.

REGULARITY.—Signifies that the entire growth is uniform in its growth or length. Neither trueness, evenness, nor general wool characteristics are taken into consideration, but simply the growth.

FREEDOM OF GROWTH.—This characteristic implies that all the fibres in the staple must be of a free, independent growth, lying parallel throughout their entire length. For combing purposes freedom of growth receives great consideration from the manufacturer, as such wools pass through the different machines, especially the combs, more easily or with greater freedom; therefore, there is less noil than when the wool has to be torn in the process of combing.

FREE—A term used to denote that the wool is free from moits or foreign vegetable matter, and relates more to wool in the scoured than in the greasy state.

DENSITY IN FIBRE—Implies that physical properties of the fibre are of close and compact structure. If two fibres are of equal length, and equal in weight, that fibre with the smallest diameter will have the greatest density. In other words, there is the same quantity of wool in a smaller

space, denoting a closeness of the constituent parts. Take an illustration in timbers, viz., corkwood, or kurragong, and myall. The two former have open, loose, or spongy formations, almost devoid of density, whilst the myall is hard, close, compact, or dense in the grain. This formation is found only in the best classes of wool, and is a most important and valuable property, especially to makers of the very highest class of fabrics.

DENSITY—Alludes to that growth of wool having the greatest number of fibres in a given space as being the most dense. This is a valuable feature from a breeder's point, inasmuch as it indicates a close, compact growth—in other words, a heavy fleece. The manufacturers prefer a dense wool which indicates carefulness of breeding, with a minimum quantity of waste and dirt, on account of the closeness of growth which further protects the various properties so valuable for manufacturing purposes. Sheep judges pay great attention to density, which is the true indicator to the wool-bearing capabilities of the sheep. When the wool opens freely and easily, showing too much of the pink skin, it denotes a want of density. On the other hand, when the wool feels solid, resists opening, and very little of the skin is to be seen when opened, density is assured. In some of our stud flocks there are as many as 60,000 fibres in a square inch of felt, but if we put our Australasian stud flock down at 40,000 to 45,000 fibres to the square inch of pelt, we shall be much more correct as an average. Even those numbers appear almost incredible, but when we consider that each single fibre has a separate tube follicle, in which it grows, the numbers do not then appear so alarming. The studmasters may be given the credit of having arrived at a very advanced stage of wool production by scientifically increasing density.

BODY—Means that the staple appears, and is full, bold, compact, and vigorous, something solid and substantial, according to the breed. This is a sure indication that the sheep has had plenty of good, succulent feed, and has enjoyed

perfect health. It is a true saying that wool goes in at the mouth in the shape of food, and, according to its supply and nature, so depends the greater or lesser substance of its wool; if the sheep have had a copious supply, then the wool will have substance or body; if there has been a scarcity, then the staple will have a thin or hungry appearance. The term body can be used when speaking of combing, as well as clothing wools.

DRAUGHT.—Manufacturers use this term when a wool will stand an extra amount of tension, or capacity of being drawn out to a greater extent than the average wool. Such wools are of a particularly sound, pure, clear, healthy, compact growth, with body or substance, applying to short as well as long wools. These wools are selected for making warp yarns of the better class of fabrics, which are subjected to extra strain and friction in the course of weaving.

SILKINESS.—When a wool has a soft, supple, smooth touch and bright appearance, it is said to be silky. A silky quality is not always confined to a fine wool; the massive Liecester and Cotswold have a reputation for their silkiness. This property is not found so much in highly-bred and housed sheep as in the general flock, especially when the latter run on sparse pastures. It is also the result of a bracing, temperate climate; that is the reason why we find wool from such districts possesses a much more silky texture than the wool usually grown on the flats and open plains. In New South Wales the wool from the New England and more or less in the eastern districts have a more silky nature than those from other districts. The western district of Victoria has a wide reputation for the silkiness of its wool, which is equalled by that from the ordinary Tasmanian flocks.

SHAFTY.—That wool having a full, bold, lengthy, close, compact, free growth, is called shafty. This term, when speaking of the merino, alludes mostly to the strong or deep-grown class, the same as is found amongst some of the

Riverina flocks, such as the Wanganella, Boonooke, and Uardry. This type is cultivated extensively in South Australia with great success. In several of the flocks there is a most perfect shafty wool, and, although strong, is full of quality.

DEEP GROWN—Implies that the wool is of the strong type, with a great depth of staple. This term is a very near relation to shafty, the only difference being the bulkiness of the staple, and not the quality and length. A deep grown wool may be of the same quality, and even length, as a shafty wool, but the staple formation is not so large or bold. For example, a deep grown staple will not be half so dense as a shafty staple. Take a shafty staple and divide it into two parts, and it will be a deep-grown but not a shafty wool.

BROAD-HAIRED.—Indicates that the wool is of a coarser type than the average, and that the formation is tending to straightness or deficient in crimps or curves. The stronger breeds of merino sheep produce most of this type, which is often in demand by manufacturers.

DIFFERENCE BETWEEN SOUND AND STRONG WOOLS.—Usually these two terms are used with the same meaning. Strictly speaking, there is a great difference in their respective meanings when speaking of wool. The term sound can be applied to all wool, whether fine, medium or strong, whilst the term strong alludes to a particular and acknowledged grade of wool, which may or may not be sound. A fine wool, however short, may be perfectly sound, but it is not considered to be a strong wool. "Strong or deep grown wool" simply denotes a class of wool as distinguished from a fine wool.

VIGOR—Denoting that there is a little stronger or a more lusty growth in the wool. This term is most frequently used when speaking of the wool of a stud sheep, which is required to be stouter in its formation, applying alike to fine, medium, or strong merino; for instance, taking a fine wool

with a diameter of $\frac{1}{1300}$ of an inch as the lowest measurement, and, say, for example, $\frac{1}{1700}$ of an inch as the finest limit, that wool measuring $\frac{1}{1300}$ of an inch would be called the more vigorous of the two.

ROBUSTNESS—Is closely allied to vigor, and is used when describing a ram's wool possessing above the average amount of firmness and strength for its breed or type. A fine wool can be robust as well as a strong.

MASCULINITY—Referring to a wool having great strength, or very stout and male-like. When pastoralists are selecting stud sheep, much attention is given by them to the fleece, and they prefer to see that it possesses such masculinity or sturdy growth more especially in the male parent. This masculinity is found mostly on the folds and the edges of the wrinkles, which will be covered by a growth much stronger than that found on other parts of the fleece. Some breeders select those sheep having hair on the wrinkles, folds, and the britch, claiming that this hairiness denotes true masculinity.

EFFEMINATE—To convey the idea that the wool is becoming too delicate, soft, or weakly—quite the reverse of masculinity.

FOLDS.—An over-abundance of skin, folded or doubled so as to lay or lap together and form one large piece or fold. These folds are very conspicuous on the front of the highly-bred stud rams of the present time.

APRON.—Applies to the massive folds on the front of the classic stud sheep.

WRINKLES are the various small ridges or creases found on many sheep, and are called wrinkles or small folds.

DEPTH.—Applies to the length of the staple. A wool of a desirable length will have a good depth of staple.

TAREING.—Signifies that in the course of manufacture a wool will yield a satisfactory amount of pure, clear, sound sliver or carding. This term is used mostly amongst top makers or wool-combers, when they say a wool will tare well, or give a good return of top or sliver.

FAULTY WOOLS.

NOILY.—This term is used in reference to combing wools only, and means that there is an open, fuzzy, wasty growth ; also any weak, webby, or frothy wool is called Noily. Wool whose fibres cross and most tick-stained wool are considered noily, likewise wool giving much noil in the process of combing. We find a great proportion of noily wool come from the Western country, and from open plains of other districts. The sheep having little or no shelter, the outside of their fleece becomes perished. This as it passes through the combing machine is combed out, when it is called Noil.

OVERFINE.—All wools are so called whose curves become more pointed and run into one another like the meshes of a net. The fibres of this form possess very little uniformity or elasticity, and their growth is very thin. The formation of the staple is always imperfect, and a portion of the wool fibres grow simply upwards. Yolk does not exist in sufficient quantity ; consequently such wools are always dry, and their value is small.

CLEAR.—The staple is called clear when the structure of a wool is even, true and uniform, and the curves of the same are distinct and easily recognisable. The form of each crimp or curve is still normal, and although they are uniform they are found to be much closer than in the watery type. The union of the several strands is not so intimate, and the form of each crimp or curve stands out clearly. The staple is cylindrical in shape, the growth of the fibres very close upon the skin, and of equal length and strength. The staple is small bodied, and the wool is of great value.

WATERY.—It consists of perfectly even staples, of cylindrical form, and of equal length. The crimp formation always appears true, but rather cloudy, and should be regular and even. The binders of staples here only grow through and along the surface of the stem, and never further down.

The yolk should be light in colour, plentiful, very liquid, and not deposited in small lumps between the staples. This form is always of small-bodied types, and is found only in small-fibred wools.

WEBBY.—As the name indicates, that the staples are light and cloud-like, reminding one of a cobweb. The fibres are very delicate and straight, the curves very wide and indistinct. The wool has lost all character, and is of very little value. Sheep growing this type of wool should be fattened and sold to the butcher.

FEATHERY.—Appears light, open, fluffy or webby, and is also a delicate wool.

FROTHY.—Frothy means foamy, light or unsubstantial. This style of wool varies much in its formation, and is placed loosely on the skin. In many examples we find the character well defined, whilst in others it is plain and almost straight. The appearance is light and bright, and generally pleasing to the eye.

VEILED.—Wool is said to be veiled when its curves are intermixed and scarcely discernible. This happens when a portion of the fibre of the one group does not unite to form a staple, but partially joins another. These overlapping fibres are said to be veiled. The form of the curves is mostly normal; the fibres are always of aristocratic character, with a large-bodied staple.

FLUFFY.—Is a wool light, open, flocky, or downy, and of a misty appearance. Wool of this description indicates a light, delicate, or effeminate growth. The fibres are small and characterless.

CLOUDY.—A wool with an overcast appearance; the formation is indistinct; it lacks density, although it may appear bold. It is a wool wanting in character and quality.

CRAPE.—This is a kind of wool which in its formation resembles crape. The curves are very fine, close, and cling together so much that the staple resembles a crape tissue.

This crape formation is a most perfect wool for the manufacture of the finest cloths which the merinos are capable of producing. It contains the excellent qualities of a clothing-wool in itself, but the outward appearance of the staple has the peculiarity that these qualities appear veiled by its confused formation.

COTTONY.—It has a loose, full appearance, and is inclined to be a little cloudy or misty. It is mostly inclined to be delicate, and has a downy look.

THREAD-LIKE.—This name is given to wools when the curves are misformed and take a spiral structure. The strand formation is discontinued, and each fibre grows up independently. There is a great scarcity of yolk in such wool.

PLAIN.—Plain is the wool where the curves in the staples are scarcely discernible. The staple formation has ceased altogether, and the fleece is only very slightly held together by binders. The yolk is very insufficient in quantity. This form is not very often found in the merino; when it is, the wool is always glossy in appearance.

STRAIGHT STAPLE.—When it is formed of only a few isolated binders, and each individual staple appears almost isolated. A fleece of this kind often divides into separate staples after being shorn. The yolk in it is often not sufficient. The form of the curves is crowded, but still the wool is not highly serrated.

The staple formation has ceased altogether, and the fleece is only very slightly held together by binders. The yolk is very insufficient in quantity. This form is not very often found in the merino; when it is, the wool is always glossy in appearance.

BADLY BRED.—The fibres are straight, irregular, and generally deficient in quality, and of no particular type.

CURLY.—Of all wools this is the most imperfect, and should not be found in a flock. It consists of most of the imperfections to be found in wool, in fact, it may be said that the wool has changed almost to hair. The curves take all forms, the character is gone, the staples are irregular in length, and have a thin open growth.

STRINGY.—As the name implies, a thin, small-bodied stapled wool. This defect relates more to the growth than the formation of the fibre, the staples lying loosely and showing much of the skin, when they have a stringy appearance. These staples are affected by being exposed to the climate through being so open that they become dry, and have a twisted look. They are never found in a dense wool.

LOCKY.—Indicates that the growth is thin and little, also the staples have a thin, stringy formation, with a wasty tip extending well down the staple, thus it is seen, the wool is of a thin, spare growth. It appears as if the staples had been wet, then dried, giving it a stringy appearance.

OAKUM-LIKE.—Such is the term used when the curves are flat, the structure lacks uniformity, and the fibres form a confused mass.

WIRY.—Is a most objectionable type, and a sheep producing it should be got rid of by fattening for the butcher. The fibres are thick, straight, and hard, the crimp structure is lost, and each fibre grows up independently without any form of staple.

HARSH.—As the name implies, a wool hard to feel, or touch. This is found in some breeds of our merino sheep, but often it is caused by the absence of yolk, or a dry, dusty season.

BRITTLE.—Is a wool that will break off short without stretching. This is a very great fault found in the wools of some countries, such as Egyptian, East and West Indies. In the Australasian colonies it is a very rare occurrence to find a brittle wool in its true meaning. The climate above all

others is in direct opposition to anything brittle in wool. We have wool of a hard nature, but rarely brittle when compared with that from the countries mentioned.

KEMPS.—Are hard, brittle, opaque, white hairs, sometimes brown and black, found in sheep, indicating a want of purity of blood. These are most objectionable fibres, being celless, which accounts for the hard and brittle nature, and should not be found on a merino sheep, but when present are on the head mostly, and sometimes on the britch, and have a very damaging effect. To the manufacturers kemps are detestable, as their nature prevents them from being successfully used, as in the course of manipulation they break off short, and resist dyes. When wool contains kemps it is used for low undyed goods, as blankets, rugs, saddle-cloths, &c.

GARE.—Is a straight fibre, inclined to be glossy, which is the only difference between it and kemp. When found in a fleece gare can be easily detected, as it stands out prominently, and will not mix with the wool. It is found mostly on the legs of the sheep.

DOG HAIR.—Applies to bristly or maney hairs found on the wrinkles and thighs of some merino sheep. In some countries dog hair is cultivated in the stud sheep, and is claimed to be a sign of masculinity.

HASLOCK.—A name given to a small lock of wool found on the pit of the throat of a sheep, and is claimed to be the coarsest wool to be found on a merino sheep. All sheep have this small lock of Haslock, which is sometimes called Breast-knot, and can be covered by the tip of a finger. It may be said that this lock resembles the beard of a turkey, which is quite distinct from the feathers, being a strong hair, and very distinct when the bird has been plucked. On a fleece it is unusually glossy, very coarse, and best seen from the flesh side. Some very low, hairy, crossbred lambs' wool is recognised, and is sold as Haslock, simply on account of its roughness.

CAST.—Relates to anything rough or badly bred found in a clip of wool.

SHANKINGS.—The name given to the trimmings of the legs of the sheep. These are very short and bitty, composed generally of a low wool, hair, kemps, and gare. Shankings are made into the lowest classes of woollen goods, such as low carpets and rugs.

DAGS.—Matted, dirty locks, caused by the droppings of the sheep adhering or clinging to the staples. This is the result when a sheep has been suddenly changed on to fresh, green pastures.

MOITS.—Refers to all vegetable matter in the wool, viz., straw, hay, leaves, twigs, thorns, burrs, seeds, &c. According to the seasons, there are found more or less moits in the wool. In a good season, when feed is bountiful, there will be most moits; if a bad season, then the fewer. Even in a fair season there will be found more moits about the head and neck than in any other parts. Amongst hoggets there is a great propensity to push their heads amongst the lower branches of the scrub and fallen timber, so as to get at any green shoots of herbage or grass, and in doing so a great quantity of moits get into the wool. This is one reason why it is most necessary to take out the necks when skirting a fleece.

GRITTY.—Denotes that the wool has a hard, unnatural feel, caused by the presence of grit and sand. Grit and sand have a very detrimental effect upon wool, as they dry up the yolk, thus depriving it of its proper nourishment, making it hard and unkind. Gritty wools are mostly found in Mulga and Gydia countries, where the land is loose and gritty.

EARTHY.—When a wool contains much dust, from a rich soil, black or chocolate, as found in rich agricultural lands, the wool is called earthy.

SEEDY.—Applies to a wool having grass seed in it. Grass seed is one of the worst kinds of moits found in wool, being most difficult to remove, as the stems are tough and lay parallel with the fibre.

BURRY.—Any wool having burrs in it is called burry. There are different kinds of burr, the largest being the Bathurst, which is not difficult to remove, the worst being trefoil and clover, the heads of which have spikes or horns, to which the wool clings, always causing a loss during the process of extraction.

MUSHY.—Means open, perished, wasty, or noily. The exterior of the fleece, especially out on the Western exposed plains, is seriously affected by sun and dust, causing the tips of the staple to become deadened or perished. Frequently the ends of the single fibre split and spread, making it larger or out of proportion to the staple.

FUZZY.—The growth of the wool is open and spongy, and, when grasped, closes readily, although the wool may appear bold or bulky.

WASTY.—Applies to both greasy and scoured wool. A tender or a fluffy wool will make more waste in the process of manufacturing, when the bulk will gradually shrink or waste away. Also, a heavy, yolky, sandy wool will waste or shrink much in the course of scouring. A scoured wool, mixed, entangled, or ropy, will waste much more than a free, open, scoured wool.

HUNGRY WOOL.—When a wool is inclined to be too fine, otherwise too effeminate or delicate, and the staples are thin or shelly-looking, it is called “hungry wool.” A dry season is generally the cause; the want of proper nourishment has caused an insufficiency of succour in the shape of yolk, therefore the wool has a starved appearance. Such wools have a rather inviting appearance, are of a good colour, light-conditioned, and handle soft and kind.

SHRINKAGE.—This term is used to indicate that the wool will lose in weight in the different processes of manipulation. A wool will shrink more or less in scouring; also, a tender or brittle, hard wool will shrink in the machines

YIELD.—Means the actual weight of clean wool after being scoured, also the amount of top yielded whilst passing through a combing machine. It also refers to a waste, that is, the quantity of noil the wool will give or yield in the process of combing.

OVERGROWN.—As the name infers, of an unnatural growth. The natural growth of wool is 12 months, and when it is allowed to remain on for a longer period, there are signs of over-growing, with a gradual inclining to faultiness. How many months' growth will determine whether a wool is overgrown is uncertain, as the fine and medium classes, on account of their shorter length, do not show overgrowth as readily as the longer or deep-grown grades. The wool is invariably a deeper color, whilst towards the end of the staple it appears wasty well down, caused by the extra length falling in open locks, which are damaged by heat and dust. The staple ends are always more or less entangled and wasty, and generally much larger in proportion to the bulk of the staple. (A sheep has been known to carry its fleece for four years without showing the least sign of a break or thinness, the staple on the side measuring 24 inches and the belly 19 inches in length.) An overgrown merino wool loses its commercial value, being too long for its fineness, and being generally wasty. In hoggets, we often see part of the flock carrying fleece up to 18 months' growth, the remainder with a more natural growth. The 18 months' growth for some time has been deteriorating in value, and in a bad season the sheep runs the risk of losing its fleece altogether. This is one reason why all owners on extensive breeding stations should shear their lambs, so that in the following year all the hoggets would have a wool of a uniform length, therefore a more desirable and suitable wool to present to the buyers.

BULKY.—Relates to wool, long or short, being over the average in its bulk or growth for its class.

LOFTY.—A wool of a full, bold appearance, applicable to all classes of wool; even noils, short wool and locks, when of a larger-bodied growth than the average, are called “lofty.”

TIPPY.—A wool having too much or an over-abundance of tip.

FRIBS.—Are second cuts caused by indifferent shearing. In the course of shearing, it frequently occurs that the shearer does not take off the fleece regularly, cutting sometimes deeper than at other times, causing ridges on the sheep when shorn. The shearer will then clip these ridges a second time, and the pieces clipped off naturally find their way to the floor amongst the dirtiest of the wool—the locks and trimmings.

FRIBBY.—A fleece is said to be fribby when a great number of second cuts or fribs fall out when it is shaken or in the process of rolling. When these second cuts are numerous they cause a great irregularity in the length of the staples. Some will be a serviceable combing; the next might be only a clothing length.

COTTY.—Is a matted, entangled or felted wool. This objectionable fault usually renders the fleece perfectly useless for manufacturing purposes. Really the only use they can be put to is to make them into mats, when they look well in their proper place—on the floor. Sickness is one of the main causes of a wool coting, when the wool is deprived of its proper succour, yolk having ceased to nourish the wool. Under these conditions the fibres become dry, and instead of slipping over each other, as when yolk is present, they entangle or cling together, and in time form a thick, entangled, board-like woolly mass. It often occurs that coting is so intense that it makes the fleece so thick and tough that it is impossible to tear it to pieces even with the aid of hand hooks. Some lands of mineral formation, as lime or iron, will cause the sheep depasturing on such lands to have their fleeces more or less cotty. In the Highlands of

Scotland and the North of England all the wool is more or less cotted, especially if the sheep have not been greased or buttered.

FAST.—A term used to indicate a slightly cotty fleece or wool when in the early stages of coting. The fastness appears on the flesh side, which opens out like unrolling a blanket, and when handled the fast or slight cottiness can be very easily opened or spread out. Such wools, especially in combings, yield a great amount of noil, all the “fast” in the combing process going to noil.

MONGREL WOOL.—The wool of a mongrel sheep; also applies to the wool of any breed that has lost its type. Some wools have come under my notice shorn off pure bred merinos, which were without the least trace of the merino character, and were called by experts cross-bred. To be correct, the wool could not possibly be cross-bred, being off pure bred sheep, so cross-bred was substituted for a worse name, viz., Mongrel wool.

SHIVEY.—Relates exclusively to the formation of the staple, indicating that it is thin and shell-like. Such formation is frequently found in the wool of aged sheep, when the staple appears a normal size or width, but, upon close inspection, is found to be very thin, flat, scaly or shell-like.

CRUTCHINGS.—In these colonies crutchings is the name given to those trimmings clipped off the hind part of the sheep. Amongst the long wools both crossbreds and deep-grown merino, it is often found necessary to free the hind quarters of wool.

In Britain, where most of the sheep are washed in a dam or running stream, the shepherd uses what is called a crutch, or long-hooked rod, so as to immerse the sheep as they pass through the water. When this operation is performed, the sheep are full-woolled, therefore, there is much loose wool left behind through crowding together. This is afterwards gathered and dried, and sold to the wool-stapler or manufacturer as crutchings.

UNSOUNDNESS.

Wool is a curious and sensitive fibre, and there is not another so susceptible to injury. The structure and general wool properties will be as near perfection as can be one year, whilst the succeeding year the wool, in general, may be all imperfections, making it of incomparably less value for all purposes. There are many causes of unsoundness in its varieties, such as sudden or a long, lingering sickness, a sudden change from a poor to a good pasture, and changing from a hot to a cold climate.

TENDERNESS.—Is applied to a wool so weak as to break in any part of the staple, and not in one particular part. The wool may appear to be of a healthy, sound growth, but instantly, when tension is applied, it severs easily, just the same as down or cotton would do. Tenderness is caused by a long, lingering sickness, when the wool does not receive its proper nourishment in the shape of yolk. A continuous droughty season impoverishes the wool greatly, through the want of water, causing it to become tender. A want of feed will also have the same effect. Tenderness is frequently caused when there is much seed in the wool, the result of the action of the yolk upon the seeds which rots them, they in turn rotting the wool.

BREAK IN WOOL.—This is a fault quite distinct from tenderness, and signifies that the wool will break in a certain part of the staple. Above and below this break the staple has perfectly sound growths, so that it will be easily seen where lies the difference between a tender wool and a break in wool. This break is very distinct in many instances, and when holding up the staple by the tip the end or bottom part will fall off. In most cases this thin part or break is readily observed, a thin line running across the staple. This defect is the result of a sudden sickness, or a change from a bare to a green, luxuriant pasture. During severe illness the blood of the sheep becomes impoverished and

weak, and does not throw off those elements from which wool is formed, therefore causing a stoppage of growth. This thin growth appears throughout the whole of the fleece, and is so regular that one can tell at what time of the year the sickness took place. When a sheep has been running in a bare paddock where the feed is scarce, the wool is naturally wanting in vigor. If these sheep are taken out and put on rich, abundant young feed, in a few days a stronger and more healthy wool appears, leaving a decided mark showing where the healthy growth commenced. This mark is where the break occurs, and it is often so thin that part of the wool will drop off.

ATROPHY.



FIBRE OF DISEASED WOOL.
ATROPHY.

ATROPHY.—When a wool fibre varies in diameter it is called untrue, which is caused by “atrophy,” or wasting away of certain parts. This is the result of poor feeding or sickness. In some instances we find a sudden contraction of the fibres at certain points, which is frequently sufficient to give the edge of the fibre a notched appearance, while in other cases we find a more gradual contraction.



FIBRE OF
DISEASED WOOL.
HYPERTROPHY.

HYPERTROPHY.—This formation is caused by a defect termed “Hypertrophy,” or morbid enlargement. With reference to hypertrophy none of the sharp or pronounced variations are found; the fibre begins to enlarge at certain points, and this enlargement may continue throughout the length of the fibre, until obtaining a diameter of even twice the dimensions of other parts. Whenever these abnormal forms occur, the size of the epidermal scales of the outer layer as well as the diameter of the fibre are affected, the internal structure is, in fact, affected, which greatly reduces the strength of such fibres. Atrophy and hypertrophy are really diseases in the wool only, which cause malformations as described.

CONDITION.—Is used to indicate the state of the wool. It may be in good or normal condition, and it may be in bad condition.

RICH.—Relates to wool with free, healthy yolk, which imparts softness, and it is of a rich brown appearance.

SAPPY.—Buyers say a wool is sappy when it handles fatty, and wish to imply that the wool is inclined to be on the heavy side, through the presence of yolk.

FATTY.—When a wool handles sticky, it is said to be fatty.

PASTY.—Used to imply that the yolk is of a thick, heavy stiff nature, or that a wool carries an overabundance of sticky yolk.

SUETY.—Denotes that the yolk is in an unusually heavy, lumpy condition. In such wools generally a brown yolk adheres to the fibres in small lumps or particles, causing a difficulty as well as a great loss of weight in scouring.

COLOUR.

COLOUR is one of the most valuable and important properties in connection with wool for manufacturing purposes, there being a great many varieties of colour. The different degrees of colour in the various breeds of sheep are numerous, generally caused by climatic conditions adding to or diminishing the capabilities of the wool for taking the many shades and colours to which wool is dyed according to requirements. It must be mentioned that the greatest proportion of wool is dyed either before or after it is manufactured into yarns or fabrics, so that colour is a great consideration, and according to its aptitude to take dyes the value of the raw material is increased or diminished. Colours must be divided as follow, viz. :—Lustre, First Demi-Lustre, Second Demi-Lustre, Brightness, White or Chalky, Black or Brown, Grey, Brown Grey, and Variegated.

LUSTRE.—Implies brilliant, silvery, metallic, glossy appearance, and is found in the strongest breeds of sheep, such as the Lincoln and Leicester only, and to this class may be added the “Mohair” of “Angora Goat” and Alpaca fleeces, which are placed amongst the lustres by the manufacturers. The reflective power of the growth or covering of these breeds exceeds that of any other wool producers. This is caused by the formation of the scales or serrations, which, when dyed, will take the most delicate shades, giving a more brilliant or silvery appearance than any other wool. Hence the name of Lustre.

FIRST DEMI-LUSTRE.—Demi means half; therefore, the colour is not pure lustre, and will not take the same delicate dye or shades, still having a glossy appearance, but not to the extent of the pure lustre.

SECOND DEMI-LUSTRE.—There is a less shiny or metallic appearance in this type of wool than in the first demi, and it can take only a deeper or darker dye than wools of the former class.

BRIGHTNESS.—Signifies a softer or kinder shade of lustre. This term applies mostly to our merino, although the term is often applied to the lustre families. This is a mistake, as no merino, however bright it appears, will ever have so glossy, silvery or brilliant a colour as either the Lincoln or Leicester wool when scoured. The very formation of the scales of the finer wools will not allow of this. Being thin or more delicate than the stronger wools, these, therefore, have not the same reflective power. There are many degrees of brightness in the merino, but never that shiny appearance to be called lustre. I have scoured great quantities of these different breeds of wool, and when the brightest merino is put alongside the Lincoln or Leicester wool the difference is very pronounced.

CHALKY OR WHITE.—Implies that the wool is rather dull or has the appearance of flour, chalk, or a want of brightness; they are generally dry and good yielding types. These wools may be found amongst the flocks out on our Western country, from about Nyngan right through to the Queensland border. The Downs families are also of this class.

BLACK.—The wool coming under this term has the darkest colour in the grease, and can only be so-called in that state. When it is washed the black is turned into a grey, commonly called self-grey. This class of wool is most valuable when there is a total absence of white fibres.

GREY WOOL.—Means that the black wool is intermixed with white fibres. Often in the ordinary wool there is found intermixed black fibres, when the term grey wool is also used.

BROWN.—Is the name given to wool of a dusky color, inclining to dark red. When scoured this class is also called "self-grey," but is of a brighter shade than found in black scoured wool.

BROWN GREY.—When the brown wool contains white fibres it is called brown grey.

VARIEGATED.—Applies to wool of various colours found in a fleece. Sometimes a fleece at one period of its growth will be black, underneath a line of white followed by a streak of grey, then again by a brown. Each of these colours is grown at the same time, giving the wool a streaky appearance, as if it had been dyed first black, then brown, then a mixture of grey, often followed by the natural, bright wool. These various growths give a variegated appearance.

DEFECTIVE COLORS.

WATER-STAINED.—Such wools have a white and lifeless appearance, caused through the sheep having passed through a very wet season. The sheep, through the frequent rains, and often through having to go into shallow dams to get a drink, get their wool saturated with water, and when it is dried leaves it white, the brightness having been destroyed, making it a faulty leaden color, resembling a light, rainy cloud. Water-stained wool, however well scoured, will never regain its brightness.

TICK STAINED.—Applies to a wool of a heavy, leaden appearance, mostly found in this wool when scoured. The cause of this defective colour is through the neglect of the owner in not dipping his sheep; therefore it is an expensive piece of mismanagement. In the Eastern and greater part of the Central districts of this colony, also the southern colonies, it is most necessary to dip the sheep, so as to kill all the insects and cleanse the skin, thereby assisting and encouraging the growth of wool and imparting both strength, softness, and brightness. If the sheep are allowed to go undipped, the ticks and other pests increase quickly, as they live on the yolk of the wool, and rob it of its proper nourishment, cause the colour to fade and become a sickly green. Ticks likewise stain the wool, and leave it with a nauseous smell and a hungry, sour look. The sheep are also in a perpetual state of irritation through

the presence of ticks, rubbing against anything with which they come in contact, making the exterior of the wool open, taggy, and wasty, and thus greatly injuring the fleece. Considering that sheep can be most effectually dipped at a cost of a farthing to a halfpenny per head, which means a difference of fully 2d. per lb., or about 30s. per bale in favour of dipped wool, it is surprising that this most important part of sheep-husbandry is not universal. Any improvement imparted to wool by means of artificial treatment, which has proved a success by enhancing its value, should be taken advantage of.

YOLK-STAINED OR DISCOLOURED.—Denotes that the natural colour of the wool has changed through the decomposition of yolk. Although the cultivation of yolk is most necessary in the production of a high-class wool, it often occurs that the colour of the wool suffers through its agency. Yolk, like wool, is subject to climatic effects, when it often becomes diseased, sickens, and dies.

Under any of these circumstances the wool also is injured, the sick yolk gradually loses its lubricating power, becomes stiff, collecting in a body on the fibre, when the wool becomes discoloured, and also suffers in quality. According to the state of the decomposition of the yolk, so the colour is permanently affected. In the early stages of disease there is a light yellow colour, and as the disease advances the colour becomes darker or brown. At times the dead yolk is immovably attached in lumps to the fibre, appearing like small pieces of resin. In a rainy season sheep producing most yolk are in greater danger of their fleece becoming discoloured than those with a lighter and freer yolk. The rain, if it is not shaken off, or if it does not run off, settles in the fleece, and at once commences to stiffen the yolk, when it hinders the supply and forms a crust, which, in the course of time, becomes tainted in colour, varying from a light pink to brown, and often greenish shades. Under these circumstances the wool cannot be scoured bright, or even clean, therefore it goes on to the

market in a damaged state. A dusty season will have a similar effect, causing a stoppage or drying up of the yolk, when the colour suffers.

DINGY.—Denotes that there is a general deficiency of colour, caused by becoming faded or darkened by soil or tick stain. A dingy wool has a heavy, leaden, cloudy appearance, and is the same colour all through the entire fleece, which may be said to be sullied, however carefully the cleansing by scouring has been done. It may be perfectly clean, but never bright or white.

STAINED.—When a wool is black or brown, caused by urine, it is called stained. This is a defect totally impossible to prevent, and however carefully the wool is scoured, it has always a burnt appearance. Although the wool is stained by urine, it is one of the softest and kindest wools to handle when clean; the urine itself, being a scouring agent, imparts that softness and kindness that might be wanting in other parts of the fleece. The wool is used in making of fabrics of the darkest colours.

SOUR WOOL.—This term is used when the colour is not particularly good or bright, but of a greenish tinge, mostly found in undipped wool grown in the Eastern and hilly districts in the Central divisions. This is a wool much avoided by those buyers wanting a good combing or clothing, although it may have fineness with length, or it may be short and fine.

HYGIENE.

NATURE OF WOOL.—Of all the fibres, either animal or vegetable, there is not one to be compared with wool for absorbing moisture. This most valuable absorbent property of wool may be said to be due to the constitution being a

glutinous matter, together with the peculiarity of its construction, rendering it capable of being completely dissolved under extreme treatment with chemicals. Not so with most animal and all vegetable fibres, which, instead of absorbing moisture to any extent, will not to any great degree attract moisture until actually immersed; therefore, the value of wool for making sanitary clothes and hosiery goods, which are acknowledged by the faculty to be the healthiest fabrics to wear next to the skin in all climates. Take, for instance, underclothing made of wool, and worn even in the hottest climates; the wearer will find that any perspiration is more readily absorbed and retained than by fabrics made out of other fibres. Cotton, silk, &c., instead of absorbing the heat and moisture, will throw both back on the body to a great extent, tending to fill up the pores of the skin, thus producing an unhealthy condition. These fibres cannot be destroyed by dissolving like wool, but can only be consumed and reduced to ashes by heat. During the wintry seasons woollen tissues, whilst attracting and retaining the heat of the body by the softness, nature and texture, imparts a comfortable, warm feeling, especially when in contact with the skin. Hard vegetable fibres made into clothing reject or throw the heat back, and when it comes in contact with the skin, imparts an unnatural feeling.

HOSIERY WOOL.

This is a class of wool mostly of the medium growth, both in length and quality, and is used in a branch of manufacture distinct from the clothing, or cloths made from combing wools. Hosiery wool may be called an intermediate between clothing and combing wools, that is, it is better adapted for making light hosiery and woollen yarns. Such wools are preferable to those having a medium length, a doubtful combing length, and a little too long for a stylish clothing

wool. These wools should be of this intermediate length, and of an open, fluffy, or spongy growth, wanting in body and compactness, at the same time one of the plain or straight-fibred type. As hosiery goods are of a light, open, fleecy character, it necessarily follows that any wool of a felting nature is not in the least suitable for hosiery purposes.

Hosiery yarns require to be open, and those wools carrying a spongy growth, with mushy, noily or wasty tips similar to those grown out West on the exposed plains, are well-adapted to this branch of manufacture. The wools are simply carded, and not combed, being very lightly twisted to give a light, cloudy appearance.

A WARP WOOL.—Must be a wool in a clear, healthy, state ; full, bold, compact, close, and free in its growth, particularly sound, with body and substance, whether it be a combing or a clothing wool. Warp is a name given by manufacturers of various kinds of textile fabrics, who require a better bodied wool for a warp yarn or thread, than is needed for any other kind of yarn. A warp is the foundation of a piece of cloth, and consists of a number of threads placed lengthwise in the loom for weaving, generally from fifty to sixty yards long. Each thread in the loom is detached, or separated by flat pieces of wire, working exactly as if the thread was placed between the teeth of an ordinary hair-comb. In the loom there is considerable strain upon the warp, as it is necessary to keep it straight and tight ; also, when the loom is in motion, there is considerable friction caused by the continual passing of the shuttle from one side of the loom to the other. Every time the shuttle is thrown across the loom these teeth, as it were, are brought smartly against the weft yarn which it leaves behind, jamming it close, thus causing a great amount of strain upon the warp, which must of necessity be very sound to stand the tension.

WEFT WOOL.—A wool made into a yarn which is thrown across alternately from one side of the loom to the other by the shuttle, leaving a thread behind every time through the warp, thus leaving a woven fabric. As there is no tension when the shuttle is carrying and leaving the weft behind every time it crosses the loom, the yarn is usually much lighter, and is not spun so hard or tight as the warp yarn. Under these conditions the wool required need not have the same fulness of body, compactness or draught as a warp wool. Supposing, for instance there are 50,000 fleeces of the same length, quality, soundness, and colour; when classing, those having a full, bold, compact staple, would be selected as the warp wool; whilst all other fleeces thinner or not so massive, in other words wanting a little in body, would be selected for the weft yarn. Although the two wools are exactly of the same quality, colour, and length, a spinner would give fully a penny per pound more for the warp than for the weft wool. Making warp and weft sorts is left to the wool-sorter, and not to the wool-classer, being one of the advanced branches in the wool trade.

LENGTH OR DEPTH.

The sheep is an animal which does not change its covering every year. Wool grows without hindrance, unless checked by disease or starvation, when it loses its growth. The successive yearly growths of wool are, however, not proportionate, if left unshorn. Wool, which has been left growing several years uninterruptedly, shows a yearly decrease in the increase of length. If the growth of the wool measures 3 inches in the first year, in the second it will add about 2 inches, in the third it will add $1\frac{1}{2}$ inches; so that in a staple of eight years successive growth, the last two years will not add a $\frac{1}{2}$ -inch in length. In measuring the length of wool,

two separate conditions have to be taken into consideration, the natural or apparent, and the true length. It is often contended that the natural length, depth or height of the wool is that which a single fibre measures in its natural form, without being stretched. This is not correct, because a single wool fibre cannot be measured without being stretched. The expression "natural length, depth, or height," can, therefore, only be used with reference to the staple or strand. The true length of the wool fibre is found by stretching it until it forms a straight line. By length we understand the measurement which the wool attains from one shearing to another, or in one year's growth, which is the natural growth of wool.

HOW TO TEST THE STRENGTH OF WOOL.

A tradesman is generally judged by the manner in which he handles the material he is working, also the way he uses the tools required in that particular profession. Many a man has been condemned by the way he has commenced to cut open a bale of wool, or has taken out the wool from the bale. There are no tools required when handling unpressed wool; yet the actions of anyone operating certainly indicate whether he is used to the work, or whether he is a stranger to it, just the same as a carpenter or blacksmith can be judged by the way he uses the chisel, hammer, or saw.

Every buyer, when sampling wool, in the first place must ascertain the length of wool under offer. If he is a buyer of combing wool he requires some length or depth of staple; if clothing wool, he selects the short stapled. The same applies to the valuator, wool-sorter, and classer, who must satisfy himself in the first place as to the natural length of the wool he is handling, also test it as to its soundness, as well as examine it as to its quality. To ascertain the length of any kind of wool in its natural state, take hold of the tip of the staple with the thumb and first finger of the right hand, drawing it the way it grows between the thumb and

finger, sometimes fingers, of the left hand, by which it is held lightly, but not too loosely, and when the bottom of the staple is felt, stop, taking great care not to detach it from the main piece or fleece. To draw a staple away or free it from the fleece, pulling and tugging at it, and when well mutilated throwing it on the floor, is a sure indication of an indifferent and improper early training. In fact, it may be questioned whether one so acting ever served any time in learning the business. Probably not. Having drawn the staple sufficiently to ascertain the length, keep hold of the bottom with the thumb and finger of the left hand, thus retaining the two ends, pull or stretch gently so as to satisfy yourself as to its strength and length. Whilst it is stretched bring the second or third finger of the right hand, whichever comes most convenient and natural, smartly across the middle of the staple, and if it does not give way or break, but rings, it is said to be sound, a most important quality. Having now got the length, and satisfied yourself as to the soundness of the wool, the next move is to find out the quality. This is done by still retaining hold of the tip of the staple as before, and with the left hand bringing in the base to the thick part of and parallel with the thumb of the right hand. With the middle finger of the right hand hold the staple from the base very lightly, so as to allow the finger and thumb to spread or open out the staple, thus exposing the wool, so that it can be properly examined as to its quality and texture. There are three movements necessary when examining wool. First, drawing out the staple to get the length; second, applying tension to learn the strength or soundness; third, opening out the staple to ascertain the quality. Any competent wool expert will test wool in this manner, which requires a little practice when in the elementary stages of learning the wool business. Handling wool in this manner is most business-like, besides being a certain way to find out any faults, and at the same time the best way to show the best qualities of the wool.

BINDERS AND THE AGE OF SHEEP.

Many gentlemen connected with wool growing and buying will consider that it is a bold assertion to make that the age of a sheep can be approximately told by its wool. After many careful examinations of the wool of sheep of different ages, it is confidently asserted that there are peculiar indications in the way by which the staples are held together to enable one to say what were the ages of those sheep. The first comparison was made by thoroughly examining a hogget fleece and that of an old ewe. The former is known principally by its pointed curly tip, and by the manner the binders are attached to the staple. In a hogget staple the binders (those fibres which connect the staples so as to form a fleece) are attached to the very tip, the same as the ribbons to the may-pole, which are easily detected as the staple is being drawn out, giving an irregular appearance to the whole length. Or it may be said that the binders are connected to the staple throughout its length. Take, now, the other extreme—the wool of an old sheep. The staple when drawn will come out almost in a bunch, or independently, and if there are any binders they will be few and very loosely connected to the very base of it. Noticing this marked difference between the old and young wool, other fleeces of sheep of different ages were also examined, resulting in the conviction that the age of a sheep could be approximately told by the position of the binders on the staple. Take the fleece of a two-tooth, say up to 20 months old, and compare it with the fleece of a hogget of the natural 12 months' growth, and upon drawing the staple it will be seen that the binders of the two-tooth's or 20 months'-old wool will not be attached to the top or tip as in that of the hogget, but a little further down. The binders in a four-tooth sheep will be connected a little further down the staple than in the two-tooth. In a six-tooth's wool the binders are lower down than in the four-tooth's staple. The eight-tooth sheep's binders show out very near to the base of the staple, and as age creeps on the binders are almost absent.

DIFFERENT QUALITIES OF WOOL IN THE SAME SHEEP.

Why do different parts of the sheep produce different qualities of wool? This is a question rarely asked, although in the profession it is universally acknowledged that such is the fact. No single sheep, however well bred, will grow a wool of the same quality throughout, neither are there two fleeces exactly alike in the 80,000,000 sheep of Australia. The front part of the sheep always produces the finest wool. Why? To answer this question the whole of the physical structure of the sheep must be considered. In the front part are situated all the vital organs, or the machinery of the sheep. Within the breast, shoulders and brisket this machinery is continually at work throwing off moisture, heat and perspiration, imparting a more succulent and juicy flavour to the meat, far in excess of that of any other part of the sheep. This moisture keeps the bones light, soft and porous, they being naturally of a fine character throughout the whole of the front half of the sheep. Taking next the flesh surrounding this light, bony formation: upon examination it will be found to be very fine in grain, much more so than any other part of the body. Now the skin encircling the front half of the sheep is the next to inspect, when it will be found that it is thin, fine, and elastic, yet strong, therefore in keeping with other characteristics. Under these circumstances it is only reasonable to claim that according to the laws of nature, the covering or wool grown on this part must also be the finest to be found on a sheep. Further down towards the hind part of the sheep we find the bones, flesh, skin or pelt gradually, but certainly, getting coarser. Take a leg of mutton and compare it with a shoulder; there is a marked difference; the flesh of the former is much coarser in the grain than the latter, also the same difference will be found

in bones. Again look at the difference in the texture in the pelt ; that from the britch or leg will be found to be coarse, thick, spongy, and not by any means strong, whilst that from the shoulder will be fine, pliable, sound, and will stand tension.

Many men connected with the wool trade, more especially amongst fellmongers, claim that the finest wool is found on the back. This statement cannot be accepted as correct. The back wool above all other is the most exposed part of the sheep, and, if there is any weakness in the wool, the back is the first place looked to for it. The flesh and pelt are a little coarser than on the shoulder ; the wool does not receive the same amount of succour or nourishment in the shape of yolk, whilst the heat of the sun, together with the dust, keeps the wool dry by absorbing or drying the yolk, making it hard and coarse. Therefore, instead of placing the back wool first, it should go into the fourth and sometimes fifth place.

HINTS TO SHEARING SHED MANAGERS.

There are many circumstances in connection with shearing time requiring more thoughtfulness than is mostly shown by those in charge of a shearing shed. It is acknowledged on every station throughout the whole of these colonies that to get good table hands to do the skirting and rolling is almost an impossibility. Yet, how many times will even those who are loudest in complaints of the inability to get careful table hands (who have caused the classer a lot of time and trouble to fit them), take some away from the tables to give a hand in the drafting yards, or even to assist in loading the wool or to do any other rouseabout work. Any manager stands in his own and employer's light by taking any table hand away when once he is broken in to the work. Most managers and owners draw the number of hands too fine, and look to the wool table hands for assistance, and by so doing disorganise the most important part of

shearing, that is, the getting up of the clip. Any neglect in this branch usually means a serious monetary loss in the value of the wool, as the occasional insufficiency of hands causes the get up to be irregular, and so the whole suffers. What all owners and managers should do, is to give the classer his proper number of hands and let him be responsible for their work, having full control over them, and he should have a proper understanding that not one is to be taken away for any other kind of work. The table hands belong to the classer and to one else, and taking them away for other work makes them careless on their return to the wool table.

BAD SHEARING.

Bad shearing is one of the abominations of the shearing-sheds, causing nothing but trouble at every stage—in fact, it unhinges the whole work. A pastoralist grows wool as a business, and he should insist upon having his fleeces taken off both closely and evenly. In a shed where the manager is a little lax, the shearers naturally get into a go-as-you-please fashion, cutting and slashing the fleece, one cut being well down, the next cutting the staple in half, thereby doing great damage to the wool. Thus the fleece contains long and short staples, the shearing operation having destroyed some parts of the fleece, whilst in other parts there is the full natural length, sufficient to make it a combing. This kind of work places the wool-classer in a very unfortunate position, as he is expected to have a sort equal in length, quality, color, and condition. How can he keep his sorts equal in length under these conditions? The wool-selling brokers are especially loud in their complaints when they find a fleece or fleeces of different lengths, frequently questioning the ability of the wool-classer. But the mischief does not rest at this stage. The manufacturer soon finds out to his cost that such uneven fleeces, caused by indifferent shearing, waste or soil heavily. This happy-go-lucky shearing is not confined to the hand-

shearer, for the machine-shearers have much to account for, more especially the contract machine-shearer. It would be of great benefit to the pastoralists if they would insist upon the contractor shearing closer, thereby getting more wool, and see that the fleece is not so much torn to pieces, and that there are less fribs made than at present.

BRANDING SHEEP.

This may be called a troublesome question, and as a problem has it been solved? Certainly, it looks simple to cause so much trouble, but it is the root of many serious complaints from wool buyers and users. Yet, still remains the question, "Has any sheep-branding liquid been discovered to successfully supplant the use of tar or pitch for that purpose?" Having had several communications from the Bradford Chamber of Commerce and the Bradford Wool and Noil Association, calling attention to the objectionable use of tar for branding, from personal observations and enquiries I conclude that nothing tried so far as a substitute has been a real success.

From a woolgrower's point of view the liquids tried so far have caused them a greater loss than the old tar brand.

With all the latest improvements it is still necessary to pull out all brands (a piece sometimes as large as two hands) at the rolling table, and cast them aside, especially pieces of wool branded with the latest liquids, so as to be able to brand the bales "No Tar." These pieces of branded wool are usually kept by themselves in a lot, or scoured and then offered for sale. It is just here where the success or non-success can be satisfactorily judged. When these brand pieces are scoured, they usually show the wool as if it had been passed through a bath of greasy ink, instead of being a clean, white color, as it should be, considering that the brand piece is taken out of the body of the fleece. Now, take the pieces branded with the

tar—these, when washed, will shew the tar marks, which are hard, making the wool, when scoured, speckly ; but the rest is clean. But it is still an objectionable wool. At present it appears that it is best for the pastoralist to have all the brands torn out and put into a separate sort. There are always some causes of delay during shearing—rain or waiting for sheep. These are the times when to supply all hands with a pair of second-rate shears each, and have all the tar, &c., chipped off, thus making it possible to honestly brand “No Tar,” and so meet the desires of the buyers. By doing so, the grower loses only the tips, whilst the rest of the wool is as good as any in the clip. The pastoralist should at all times continue to meet the wishes of his customers, and even cater for them, but at the same time at as little cost to himself as possible. It is just possible that in a short time there will be a reliable brand presented to pastoralists which will meet their requirements, also those of the buyers. This is an American liquid, and has stood a satisfactory test. A skin was branded and allowed to stand for three months exposed to all atmospheric conditions, wet and dusty. After the wool was taken off and scoured, the result was most satisfactory. There was no trace of the brand. The scouring had obliterated all signs.

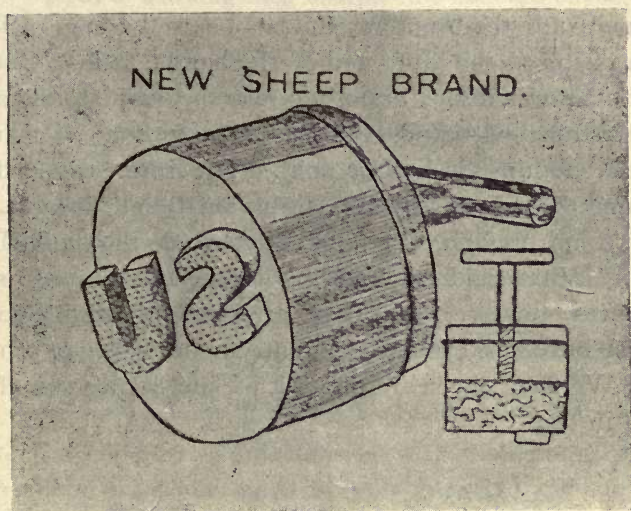
It appears that in other colonies there is the same unsatisfactory state regarding branding. Affixed is a valuable suggestion.

SHEEP MARKING.

That farming stock should be marked in some way, is almost an imperative necessity. This being the case, the question is :—How can this be best accomplished with the least pain or inconvenience to the animal, the least injury to the wool or hide, and at the same time, be distinctive, legible, and lasting?

About the oldest and most universal brand for sheep is no doubt the pitch mark. But to this there is the objection that it injures the fleece, especially fine wool. Some time ago

we learnt that Mr. John Warren, who farms on the Kubusie, had adopted the plan of snipping off all the remains of the pitch brand just before the sheep were taken in hand by the shearers. The quantity of wool taken off was very trifling, involving very little trouble, and the improvement of the clip was very considerable. We noticed in the wool-sales that it obtained top prices. Of course, it was good wool, but all the better for having none of the bits of pitch in it, which manufacturers so very much object to. *The Leader* gives the following particulars of a marker which has come into use in New Zealand:—"The design shown in the illustration is



Lambert's sheep brand. It is a New Zealand invention, and very largely patronised already for its simplicity, quickness, and cleanliness. The Canterbury Farmers' Association, New Zealand, has adopted it. The idea is to do away entirely with the use of all branding oil in the fluid form in the appliance, and the inventor simply saturates fleece wool with the fluid, and then can brand up to 100 sheep consecutively with one charging. The appliance itself is very simple, viz., a box containing a stencil at its

bottom, whilst the top serves as a guide for the handle, which ends internally in a piston, a spring being between the piston and the top. Of course, the fleece wool is put in between the stencil and the piston. The impression given is very clean and even, and the whole brand light and small. The brands are sold complete, with any stencil design as desired, at 10s. to 15s. each. Messrs. G. G. Turri and Co., patent agents, of Melbourne, to whom we are indebted for our illustration, state that the brand is simplicity itself, being a metal cylinder with a perforated zinc pattern projecting from the bottom to indicate any lettering needed. The projecting part and the cylinder are packed with wool, which has to be saturated with the branding fluid. Then there is inside the case a piston at the inner end of the handle stem. Once the wool is saturated the branding may be started, and a very large number of brands can be made without re-charging. There is nothing to leak or spill. The impressions do not blur, and the whole article is light, small and durable, quite unlike some previous attempts to supersede the old-fashioned brand. What kind of branding oil is used is not stated. There was, however, an oil or preparation suitable for this purpose introduced into this country about eight or ten years ago. We have not heard about it of late, though we think it is still in use.

BRADFORD WOOL AND NOIL ASSOCIATION, ENGLAND.

GENTLEMEN,

At a representative meeting of this Association, held to consider some items of grave interest to the trade, as per copy of the *Observer*, 15th inst., sent herewith, a Sub-Committee was appointed to enter into communication with you, and to beg your hearty co-operation in helping to abrogate the evils complained of, viz :—

1. To advise your woolgrowers to abstain from using tar or pitch in marking their sheep ; this material damaging the combing machines and, remaining in the noil after combing, seriously detracts from the value of the wool, causing losses through claim and much annoyance to the trade, which could be avoided if these deleterious materials were not used, and it would therefore be in their (the woolgrowers') interest ; also as if done away with, it would make the wool more valuable for sale.
2. Again, in shearing the sheep by machinery, to caution them (the woolgrowers) to see that their men use more care in the process, so as to avoid the false cutting of the fleece, thereby avoiding short bits which seriously detract from the value, both in the working and also in extra waste.

Impressing upon you the desirability of these radical changes, which will be to the advantage of your growers ; and hoping that you will give us your hearty support,

I remain, Gentlemen,

Yours respectfully, on behalf of the Committee,

ROBT. PRATT, *President*.

By this mail we are sending you samples of the goods made, in the undyed, as well as the dyed state, shewing you the faults complained of, by which you will at once perceive the serious damage caused by the tar or pitch in the wool.

HINTS TO SELECTORS AND FARMERS.

There are many energetic, industrious, and struggling men in these colonies, making their homes in the bush, hoping that they will be able to make an honest living for themselves and their families, besides trying to save a few pounds for a time of sickness, or when old age creeps on. To these willing and desirable settlers, who have had but little opportunity of obtaining experience with land and stock other than their own, the following few notes will, I trust, be of substantial use. All who start a new business, as a rule, experience much suspense, and frequent disappointments; and a little knowledge gained from others may be useful, if from those who have (to use a current phrase) gone through the mill. We are told, and I do not for a moment dispute the fact, that to make small selections and farms pay, and give the most satisfactory results, sheep must be coupled with farming and grazing. These branches in all other countries go together, and the same principles are equally as important to our small holders. The land in these colonies, as well as in other countries, is gradually, but surely, becoming more valuable, therefore dearer to holders; and rents and taxes are ever increasing. To meet these ever increasing demands, it behoves all settlers to consider well what will give the best and quickest returns. The first object to be studied is the nature of the pasturage; also the position, whether convenient to rail or near a town. It is granted that sheep have to play a very important part in the settlers' programme. After the fertility of the soil has been duly considered, the supreme question is what kind or breed of sheep is best suited for the particular nature of the soil, because if there is little fertility there will be no luxuriance in the pasture. Pasturage has the greatest influence upon sheep, and upon the pasture depend the quality and quantity of the wool. But there is also another equally important matter—that is the mutton-bearing capabilities of the different

breeds.* Soils consisting of decomposed granite, which are rich in potash, are not very favourable for sheep ; but if it is decided to have them, the heavy or crossbreds must be chosen in preference to the light merino. The soils much appreciated by any class of sheep, but more especially the finest merino, have a limestone or sandstone formation, upon which the finer grasses flourish. Upon carboniferous soils, sheep are bred and reared with great success. The grasses named below will give a good idea to selectors and farmers what will give the best returns.

Sweet-scented vernal grass is found upon every kind of soil in the old country, is a true permanent pasture grass for general purposes, and is an early grass. Sheep will eat it, but are not partial to it, and they will not eat if there is any white clover or meadow foxtail. The heavy English Lincolns, Leicesters, Cotswolds, and these breeds crossed with the merino will do best on it.

MEADOW FOXTAIL GRASS.—This grass grows freely upon a clayey, loamy soil, is very nutritive, and the heavy merino and Downs sheep are very fond of it. It is a good fattening grass.

SMOOTH-STALKED MEADOW GRASS.—Is an early grass, but exhausts the soil. Suitable for middle and heavy breeds.

SHORT BLUE MEADOW GRASS.—Grows in drier parts of heavy land ; is nutritious, but not sufficiently so to make up for its unproductiveness. The heavy breeds of sheep will eat it. Not a good fattening grass.

ROUGH-STALKED MEADOW GRASS.—To be found on rich, moist soils and sheltered situations, and is a very valuable grass. It does not grow well upon high and exposed grounds, and yearly diminishes, and dies out in four or five years' time. It differs greatly from many other grasses ; the straws at the time of flowering become weak and tender,

* See Pages 208 to 212.

but as they advance towards the period of ripening, the seed becomes firm and succulent. It is highly nutritive, and sheep are exceedingly fond of it. For cross-breds and merino wethers, for fattening, it is specially adapted.

SHEEP'S FESCUE.—It has a very soft and fine foliage, and is consequently better adapted to the teeth of the sheep than larger; Linnaeus affirms that sheep have no relish for hills and heaths that are destitute of this grass. In Tartary the shepherds make their summer where this grass is very abundant, on account of its being so wholesome for the sheep. All kinds of sheep are exceedingly fond of it, and they thrive wherever it is found. This is one of the best species for the finest woolled merinos.

ROUND-HEADED COCKSFOOT GRASS.—This is a permanent pasture grass, and is exceedingly productive and nutritive. A good fattening species.

WELSH FESCUE.—Is rich, succulent and productive. Sheep are very fond of it, and it is very suitable for the finer breeds.

NARROW-LEAVED MEADOW GRASS.—A good spring grass, grows rapidly, and is very valuable for permanent pastures where the soil is retentive. Is one of the best of the finer or dwarf-growing grasses, and is most valuable for sheep. Very suitable for fine merino-woolled sheep.

MEADOW FESCUE GRASS.—Constitutes a very considerable portion of the herbage of all rich, natural pastures. Best suited for heavy breeds of sheep.

RYE GRASS.—Sheep eat it, more particularly in its earliest stages of growth, in preference to most others, but after the seed approaches perfection they will leave it for almost any other kind. It exhausts the soil greatly. For fattening purposes and the heavy breeds of sheep it is most suitable.

CRESTED DOG-TAIL GRASS.—Is an excellent grazing pasture. The merinos and Southdowns are remarkably fond of it, and prefer it to most other kinds.

CAT'S-TAIL MEADOW GRASS.—An early grass, is very nutritive, and lasts well on to winter. Is very fattening, and heavy sheep do well on it.

YELLOW OAT GRASS.—Found in dry soils, and readily eaten by sheep, especially the fine-woolled breeds.

MEADOW CAT'S-TAIL GRASS (TIMOTHY GRASS).—Very valuable as a permanent pasture, when mixed with other grasses, on account of its early herbage, its great productiveness, and the superior proportion of the nutritive matter which it contains. Is most useful in the form of hay for sheep. Is a good fattening grass; the crossbreds and the heavy breeds do well on it.

BENTS.—The different species of bent, although common on almost all poor lands, possess no great value. Sheep that frequent hills are fond of it, and will leave all other kinds of pasture in order to graze on the common bent. It is more suitable for fine-woolled sheep,

Many of our selectors and farmers having the good fortune to be possessors of rich land, intend to adopt the grazing or fattening business. For this an improved system of husbandry is necessary, and crops must be grown specially adapted for early fattening. The turnip is a most useful food for fattening purposes, besides it increases the fertility of the soil in the least troublesome and expensive way. Upon the nature of soil depends the kind of turnip to be grown. The common white field turnip is best suited for light and sandy soils. The Swedish should be cultivated upon heavy lands. Swedish turnips are the densest and least liable to rot, and they have the most nutrition. It is said that half-a-pound of Swedish turnip produces 110 grains of nutritive matter, and the same quantity of the garden turnip, which is second in the order of nutrition, contains only 85 grains. The proportion of nutrition singularly varies with the size of the root in different species of the turnip. The larger roots of the Swedes afford

a greater proportion of nutriment than the smaller ones. In other species the moderately-sized roots have the greatest quantity of nutrition.

To make the calling of the grazier most profitable, it is necessary that there should be two different flocks kept, one to succeed the other for fattening and store. The former must be first turned on to a portion of the paddock separated by hurdles, when, on account of the power of selection which they possess, they will scoop out the roots that suit them best, and will come to maturity or be ready for the butcher as rapidly as if the crop had been gathered, stored and afterwards given them. The store sheep will follow them, and eat everything that has been left. This mode of feeding requires a little caution. The grazier must not allow the sheep to remain too long at first on highly nutritious food.

The mangel wurzel has recently received much attention from graziers, with good effect. It is a most profitable plant to grow on a suitable soil, but has a tendency to deteriorate the soil.

The selector having carefully studied the nature of his land, is now in a position to make a choice of sheep that are best adapted for the same. The grazier or farmer, in selecting sheep must have an eye to the carcass as well as the wool. What is wanted is to produce a good-sized body with rich flavoured meat, which, if the local markets are fully supplied, can then be exported to the British markets. It must be well-known to many that the merino itself is not the most suitable mutton for the exporting trade, the general objection being that it is too thin, with no bold, round legs, fine, large shoulders, or good square loins, as are found in the Downs breeds, which are termed "prime mutton," and always realise the highest prices. Many settlers will find out that if they keep to the pure merino they will not be so profitable as other breeds, being much longer in coming to maturity, as also are

their lambs. They will find out also, that the heavy breeds, such as the Lincoln, Leicester, and Romney Marsh, can also be misplaced, and will give poor returns. The Lincoln is next to the Cotswold, the largest of all English sheep, and produces a long, strong, and lustrous, heavy fleece. On many of the farms in Lincolnshire these sheep produce very great weights, and I have handled large stacks of classed fleeces (brook-washed) that averaged from 25 to 30 pounds each. When an apprentice, I took the average of a pile of Lincoln fleeces classed for a special firm. I counted the fleeces when packing, and after all were weighed, the average was $28\frac{1}{4}$ lb. per fleece, which were sold at $28\frac{1}{2}$ d. per lb. The mutton of the Lincoln is not to be compared with most other breeds, and is also the coarsest of all mutton breeds, besides yielding a great quantity of fat, and they are very slow in maturing. They produce heavy-weights varying from 150 to 200 lbs. dressed, at 4 to 5 years old. Very frequently unusual weights are registered. I have known fat wethers cut 24 lbs. of wool, and when slaughtered and dressed weigh 260 lbs.; forequarters, each 73 lbs.; hindquarters, $57\frac{1}{2}$ lbs. There was a great quantity of fat, which was 9 inches thick on the top of the ribs. Crossing with the merino requires judgment, as the two breeds are very different in size, and the loss of the dam frequently happens at the lambing time. If merino ewes are chosen for the purpose, they should have the largest frames it is possible to get, when the death-rate at the lambing season, to a great extent, will be reduced. The Lincoln-merino cross for both wool and meat purposes has given satisfactory results in many districts. For export and local use, the meat resulting from this cross is to be preferred to that of either of the pure-breds. The heavy gross carcass of the former is reduced in weight, and has a finer grain without large junks of fat, is more serviceable, is of a better all-round quality, and a more profitable meat for the house-keeper. The wool is also of a very desirable type, and is a class that finds a ready sale. This becomes still more

valuable when the cross-bred ewes are put to the merino rams, and produces a come-back wool which last year, in many sales, realized more per lb. than the pure merino. Lincolns require low-lying country, with a good supply of rich grasses; the crossbreds must have good pastures, which must be dry.

Leicesters are great favourites with many of the colonial graziers and farmers, for crossing with the merino to produce both a good class of mutton for export as well as an excellent and valuable type of wool. When it is taken into consideration that these two properties are obtained at a much earlier age than from any long-woolled breed of sheep, it is not to be wondered at that this cross is so much in favour. The fact of early maturity is in itself important to our settlers. The Leicesters require good pasturage, and when so placed, will weigh at from one to two years old 90 to 144 lbs. per dressed sheep. At 32 months old they have weighed as much as 368 lbs. alive, and 248 lbs. when dressed; whilst the ordinary fat wethers dress from 140 to 170 lbs. These sheep have not as much fat as the Lincoln, and what there is, is more evenly distributed throughout the lean, whilst the bone is much finer and lighter. When crossing with the merino, they give better results than the Lincoln, and being a smaller-framed animal, the risks at the lambing time are not so great. The mutton is more palatable, as well as being less wasteful, and is in much favor in the Home markets. Improvement in the wool is very noticeable by the introduction of the merino strain, which makes the lustrous, lengthy, bold Leicester staple into one of a much finer quality, adding more softness, elasticity, and quality, and greatly enhancing the value. This type of wool has done remarkably well for several seasons, and is probably the most profitable to grow.

Romney Marsh sheep, in a low-lying marsh, or bleak exposed localities, are by far the best of all breeds, and require no artificial feeding. For a flukey country they have no

equal, and will live and thrive when all other breeds fail. Under the above circumstances, they are truly a poor farmer's friend in every respect. They produce a most desirable mutton ; at three years old wethers will dress at from 160lbs. upwards, whilst the ewes will go from 120lbs. to 140lbs. at the same age. The ewes are the most prolific of all breeders, and most excellent mothers. They frequently bear three or four lambs at a birth, and, if the pastures are good, the lambs will compare most favourably with lambs from either Lincoln or Leicester ewes that have given one lamb only. The lambs are of early maturity, and fit for the butcher without any care or attention. The wool of the Romney Marsh or Kent is of a very useful type, is called demi-lustre, and is a class coming between the lustres (Lincoln-Leicester) and the English fine-wools (Downs breeds). In suitable localities, the crossing of the Romney Marsh with merino is receiving much attention, and very favorable accounts have been given of the results. The crossbred lambs are said to be well-formed, strong, and healthy, and as some of the ewes have three and four lambs each, all the good qualities are confirmed. The lambs' wool is very showy, bright, of good length for the age, and nice quality. The bold staples have an admirable crimp formation, which is readily bought at an advanced rate on that of the Romney Marsh.

Cotswold is another very useful breed, and one that would be suitable to many of our settlers, both for their adaptability to stand exposed or bleak situations, and to endure hard, rough times. They are the largest-framed sheep and put on flesh rapidly, and when fit for the market weigh 200 lbs. and over at an early age. The ewes are splendid mothers ; give two and three at a birth, and the lambs mature at an early age. The mutton is rather coarse, and suitable for a cold country, but when crossed with the merino it is greatly improved, and for exporting is a profitable class. The wool of Cotswold sheep is very long, coarse and strong, but if they are crossed with the finer-woolled sheep the wool is wonderfully improved, and finds ready sale.

The Downs families are numerous, and are the most important of all English breeds for the butchers, and are called the prime mutton classes. Of all sheep, there is not a single breed that grows into such a beautiful symmetrical form. All parts of the carcass, whenever cut into joints, are full, bold, and carry a great proportion of rich, succulent, fully-flavoured, lean meat, with a desirable quantity of fat, and it always brings more per lb. than that of any other class. The advantages to be gained by breeding these sheep are many ; they are very hardy, coming next to the merino, and will live where other breeds will perish. They are excellent feeders, put on flesh rapidly, and at an early age (12 months) will yield from 70lbs. to 80lbs. dressed weight. The ewes are splendid mothers, very prolific ; their lambs have no equal for weight, at any age, and are great favourites with the butchers. To make a choice for all-round qualities, the Hampshire Downs sheep are the most profitable, whilst the South Downs and Shropshires follow in order. For crossing with the merino any of the three last-named would be of great service to any selectors who have dry, thin-grassed country. Being of a fine-woolled and meat species, with constitutions almost equal to the merino, they are the most natural and best adapted for crossing in suitable situations. The carcass of the sheep produced by the Downs-merino cross is not the least deteriorated, weighs fully as much as the first-named breed, and, as a marketable mutton, there is no better or safer class to place before customers, for it takes its place as a prime mutton.

The introduction of the merino strain has a beneficial effect upon the wool. The comparatively straight-haired and thicker-fibre Downs wool is considerably toned down, and has become a style with more character, with close crimps, more elasticity, softness, and an additional length and weight.

WOOL-CLASSING.

TECHNICAL TERMS USED IN CLASSING.

MERINO WOOL.

COMBING.—Implies that the wool is a fair length, and better adapted for combing purposes than the clothing process.

FIRST COMBING.—A distinguishing name given by the wool-classer, denoting that it is a desirable length for combing. This sort represents the great bulk or average quality of the combing wool of the clip.

SUPER-COMBING.—Consists of the very best combing wool of the clip, being much finer than the first, and, generally speaking, the staple will not be as large in its formation.

SECOND COMBING.—Contains all the bold, robust wools, generally found to be longer and deeper grown than the first combing.

CLOTHING.—A name given to imply that the wool is of a shorter growth than the combing of any clip.

FIRST CLOTHING.—Corresponds with the quality of the first combing, differing only in length.

SUPER-CLOTHING.—The shorter fine fleeces of the same quality as the super combing.

SECOND CLOTHING.—A convenient sort, taking all the coarse, short fleeces, or those fleeces too short for the second combing.

HOGGET, TEG, OR HOG FLEECE.—Is the name given to the first fleece of a sheep which has not been shorn as a lamb.

SHURLED HOGGET FLEECE.—Meaning that it is the first fleece clipped off a sheep that has been shorn as a lamb.

WETHER FLEECE (Colonial).—All fleeces shorn off a castrated male sheep after they have had their first or hogget fleeces removed.

WETHER FLEECES (English).—All fleeces clipped off ewes or wethers after their first or hogget fleece has been removed.

EWES' FLEECES.—Fleeces shorn off female sheep.

RAMS' FLEECES.—Fleeces shorn off a male sheep.

LAMBS' WOOL.—Wool shorn off a lamb.

SKIRTINGS.—Are the edges of the fleeces taken or skirted off by the men engaged to skirt and roll fleeces.

BROKEN.—A sort made from the large pieces skirted off the fleece.

1ST PIECES.—A name given to the largest of the skirtings after the broken has been picked out.

2ND PIECES.—Are the trimmings of the 1st pieces and the smaller pieces that will not fall through the screen of the piece-picking table.

LOCKS.—Applies to all the smaller pieces that fall through the screen of the piece-picking table, also the trimmings of the sheep too small to be put into the 2nd pieces.

TOP-KNOT.—The wool clipped off the forehead and the poll.

NECKS.—Are the wool grown on the neck, and are generally inclined to be of a thin growth and generally full of moits. In skirting it is advisable to take these necks out and make a separate sort. By allowing them to remain on the fleece, especially if the latter is free, the moits in the neck would have a detrimental effect, which the buyer would take advantage of to the detriment of the grower.

WOOL CLASSING.—Is the placing of whole fleeces into different classes or grades, according to their length, quality, condition, and color.

This is about the most important and responsible position in connection with the shearing-shed, and at the same time, one of the most abused ; responsible—because a clip handled and classed as it should be, enhances the value of each grade or class, if it be placed in such a manner so as to meet the wants of buyers ; abused—it is also to an alarming extent ; if an incompetent man is allowed to have control of the work, who will make numbers of unnecessary sorts, and, in the end, not one class distinct in itself, so that neither the owner nor the classer himself knows one sort from the other. Without doubt, there are not many, certainly not more than 30 per cent. of efficient wool-classers, and these are as competent as can be found in any country where wool-growing is a great industry. When visiting wool sheds where the proficient wool-classer is in charge, one is at once struck with the tidy, business-like look of the wool room ; no accumulation of fleeces on the floor ; no big stack of pieces waiting for the piece-pickers ; and the classing-table not filled or half filled with fleeces waiting to be placed in their respective bins. Such a wool-classer will have his bins marked 1st combing, 2nd combing, 1st clothing and 2nd clothing distinctly, so that no mistake can be made in placing the different qualities of the fleeces. There will be also provision made for the 1st and 2nd pieces, stained, bellies, black, cast fleeces, whilst at the end of the week the locks from under the skirting tables will be removed. On the other hand, when a would-be wool-classer with a pushing propensity, who, by cheek and a glib tongue has got the position, is in charge, the wool room is in confusion, wool trampled upon, heaps of fleeces and pieces lying about, whilst the partition for the different classes of fleeces will be found to contain regular mixtures of qualities and conditions. It is acknowledged that there are fully 70 per cent. of these unfit wool-classers employed on the Australian sheep stations, and

if the owners could only realize the amount of money lost by employing unqualified men, they would be a little surprised. It would be far better and a saving of money not to class at all, than employ an incompetent man. Competent classing gives confidence to buyers, who will bid to their utmost limit to purchase what they require either in combings or clothings. A buyer, who is purchasing for a manufacturer who wants nothing but a combing wool, is naturally willing to even stretch a point if he can purchase just what he wants. He does not want to buy a clothing or a short wool for which he has no use, and, therefore, must sell to the user who can use it. He will always pay a greater price for what he requires than for long and short and mixed up lots. Very rarely does a manufacturer use long and short wools in his factory; his business is confined to the one or the other, either combing long wools for the smoother yarns or the clothing (short) for woollen goods, made of a yarn constructed in a way diametrically opposite to that made from a combing wool. Under these conditions a woolgrower must see that he acts against himself if he does not class his wool to suit the many different buyers, by placing the same in the hands of a qualified classer. There is fully $1\frac{1}{2}$ d. per lb. difference in a classed and skirted lot of wool, compared with one put on the market just as it comes off the sheep, making a difference of a little over £2 per bale, which in most instances go a long way to pay the shearing expenses. Also there is a difference of $\frac{1}{4}$ d. to $\frac{1}{2}$ d. per lb. between an unclassified lot that has been skirted, or from 9s. to 18s. per bale in favour of the latter. Again, a careful classer will look and see that his pieces are properly sorted. Here is a much greater margin in favour of classing, and very often the enhanced prices obtained for the well-got-up pieces will pay for all classing, wool-rolling and skirting. First pieces well got up will realise from 1d. to $1\frac{1}{2}$ d. of the price of the first fleece, 2nd pieces from 2d. to 3d. below 1st pieces, while if the pieces are mixed or unsorted they will bring but

$\frac{1}{2}$ d. per lb. more than 2nd pieces. A shed wool-classer, who takes a thorough interest in his work, will never commence by throwing his fleeces into the different bins straight off. The first duty is to be particular in getting the different standards of the different classes. In the varied districts and climates of these colonies, more particularly those of New South Wales, we find very many different types and qualities of both the merinos and crossbred wools, and it would be impossible to have the same standard of quality and condition throughout. Take, for instance, a comparison between a Riverina clip and one from Mudgee. In length, what would be a clothing in the former district would be a combing in the latter, and so, throughout the whole of New South Wales, would the different classes of wool differ, either in length, condition, colour, or quality. A wool-classer, therefore, must form his standards according to the wools he is handling, and not try and force sorts or classes, as many are inclined to do, according to the style of wool he may have handled a few hundred miles distant. Take the wool as it is and class it to the best advantage, making as few sorts as possible, but let them each be distinct and uniform. To do this it is advisable to place the fleeces opposite and near the different bins into which the classer thinks they should go; and as the shearers at the commencement or change of different flocks do not go too fast, this can be done without much inconvenience. The greater portion or average of our flocks are combing wools, the bulk will go into the first, and should be as uniform as possible in quality, length, color, condition, and perfectly sound. Second combing should be also found differing from the first in length and quality, being of a longer, more shafty and deeper growth. Frequently, a super combing is made. Super combing sort, on many stations, is often made, when really there is not a lb. of superior wool on the place. This is forcing a sort, the making of which is a mistake, and shews a want of practical knowledge. This sort should contain nothing but the very finest of fleeces, and

will be found to be a little shorter and finer than the first, possessing a free growth, with plenty of character, elasticity and softness. The clothings are divided into first, seconds, and supers also. The first is of the same quality as the first combing, and should be similar in all respects, excepting length, which should be much shorter than the average combing length. In wool-classing, clothing means shortness. Second clothing contains all fleeces of short and coarse growth of the second combing quality, often irregular in length, sometimes being of a bold, open, fuzzy class, and often short and strong or rough. Super clothing will contain the very fine short fleeces, with distinct character, light, free, of a silky texture and a kind handle. But in any case I would advise the supers combing and clothing to be of a high quality, of silky texture and good condition. In addition to the above general classification, it will be found that there will be many fleeces come on to the table quite unsuited to be put with the main classes of the wool. These are the heavier condition wools of a brown yolky character. There may be also many of a light color, but very sappy, which must be kept separate, and should be pressed by themselves and given a different brand or name—say, “Fleece,” or just “Combing.” It must be remembered that the buyers, when estimating their values, consider first shrinkage, or what per cent. the wool will yield in its scoured state; if they find a sort mixed, or varying much in condition the values will be made according to the very greasy, which might be fully from 10 per cent. to 20 per cent. more weighty than the general bulk of the wool. If on the other hand, the buyers find in a clip a heavy conditioned sort on offer, they at once have confidence and will give the utmost limit of their valuation. Another sort will turn up in the shape of badly-bred, straight, rough, hard fleeces, which should be kept to themselves also, and not mixed with the general clip. In a merino clip it is best to have these pressed separately, and on no account give them the station brand.

CROSS BREDS.

When there is a cross-bred flock to handle, it is necessary also to make as few grades as possible, and never make a clothing sort. The length of any cross-bred is considered sufficient for combing purposes. Three sorts, it will be found, will cover all requirements, often only two are necessary. The general average of the fleece should be made into the fine sort, and if a super is made, it must be the smallest grown, and much finer than the fine. In the super class great notice should be taken of the general formation of the wool, selecting for fineness, closeness or density of staple, a distinct crimp, and freedom, *i.e.*, staples clear, fibres lying parallel, in no way crossed or mixed, devoid as near as possible of noily matter, with a soft, silky texture. In different crosses the colours vary much. The Lincoln and Leicester-merino will be found to be of a more glossy appearance than the Romney and Border Leicester-merino crosses, which differs again from the Down-merino cross, which are not nearly so bright. The fine contains the great bulk of the clip and from its standard the super and strong should be made, the two latter being really requisite to keep the fine uniform, it being the average throughout, in length, quality and condition. The strong sort will contain all wools of a much coarser description; in the merino and lustre cross will be found a deeper and much brighter or a demi-lustre wool, whilst the merino Downs will be of a much finer and shorter growth and not so bright as the above.

CLASSING FOR CONDITION.

On many well-conducted stations where the sheep are carefully cultivated, so as to bring out their high-class wool-bearing properties, there is not so much necessity for elaborate grading of the fleece. These generally are medium to smaller-

sized stations, having sheep well bred, and kept up to a high standard by a systematic yearly classing and deep culling, so that there is a great uniformity of type throughout the whole flock. Under these circumstances the wool is so regular, both in length and quality, that it would be almost impossible to make distinct sorts except for condition. When such is the case, make two sorts, calling one the first combing, which would include all wools of the brightest colour and the lightest in condition. The second sort should be entirely confined to those fleeces of a brownish appearance, generally caused by the heavy condition of the yolk. The two sorts may be of equal quality in every respect, but the presence of a greater quantity of yolk in the one really causes the difference in the two sorts. A wool carrying 10 per cent. more yolk than another of the same quality has a difference of about 1d. per lb. in the respective values, being a great consideration with the buyers.

HOGGETS.

There is no class of wool grown on a station that requires more careful handling and sound judgment to do it full justice than the hoggets. There are two kinds of hogget wool on many stations—a real hogget and a shurled hogget. It is most necessary to keep them separate, even if length only is taken into consideration. On stations where there are two lambings we invariably find that the older lambs are shorn, and the small later ones are allowed to go without having their fleeces interfered with. In other instances only the large lambs are shorn, leaving the smaller animals untouched. Under these circumstances, at the end of twelve months, when the shearing time comes round, the lambs have developed into hoggets of the two kinds, real hoggets and shurled hoggets. If these have been running together it is necessary and advisable to draft one from the other before

shearing, as there is a perceptible difference in the appearance of the fleeces, and even in length. The hogget's wool will have a special curly pointed spiral tip, and invariably has a rougher or a fuzzy look, whilst the shurled hoggets will have a tip resembling more that of an older sheep, and the wool will be much more uniform in length throughout. In the sampling room there is always a danger of the buyers condemning the whole of the hogget clip in a mixed class if they see the pointed staple of the hogget and the square, level tip of the shurled hogget together, and will even contend that one is a young wool, the other from older sheep. So much for appearances. In a fair average season the hogget wool has a much better and a more taking appearance than any other class of wool grown on the same country; besides, the young wool has more nature, softness, and a more inviting colour, with general good texture. Under these circumstances the hogget clip will sell for more per lb. than other wools, and is a good recommendation or advertisement, and will, as it is frequently said, sell the whole clip. It is necessary, therefore, to pay great attention to the general get-up and a little extra trouble will repay handsomely. These young sheep are naturally very lively and frolicsome, and in racing about together with the object of seeking the finest and freshest feed, especially under bushes, they naturally collect more foreign matter, especially about the head, front, and neck, in the shape of small sticks, twigs, seed, burr, etc.

All throughout a hogget wool the moits are more numerous, and it is desirable to have the affected parts removed from the fleece, which will be found mostly on the back of the neck, breast, shoulder points, and britch. There is not much difference in the method of classing hogget's wool in comparison with that of older sheep, only that the young wool can be thrown up, or placed more into the top sorts. According to quantity or numbers I would make my sorts, taking care not to over-class the

true hoggets, making as much of the 1st combing as possible, the second containing only the very strong and longest fleeces. Amongst these sheep, on account of the irregular ages, there would be found short fleeces for the clothing sorts 1st and 2nd, but not much of the latter, whilst it might be found necessary to make a super of the finest, brightest, softest fleeces of a pronounced character. The above classification will apply to all stations with an increase of 12,000 lambs and over. Shurled hoggets' wool will be of a more equal length, the shearing having taken place about the same time. If there is a sufficient number of superior fleeces to make more than a six-bale lot, it will pay to make a super, but they must be superior in every respect to the 1st combing. The major portion of this wool will go into the 1st combing; the 2nd combing, as before, containing nothing but the strongest or coarsest fleeces. There should not be much clothing; if any, mostly 1st and 2nd, the latter containing really the objectionable-looking and very rough wools. This classification will cover all stations with over 20,000 sheep.

CLASSING LAMBS' WOOL.—The classifying of lambs' wool is the real hard work as far as a wool-classer is concerned. The first duty is to see that the tables are covered with a cloth, clean bags, or packs, so as to prevent any of the small-grown wools from falling through on to the floor. This class of wool is brought on to the tables much mixed or intermingled, so that the table hands are fully employed in looking over and taking out all the belly wool, stained, inferior, and dirty ends, so as to leave the rest as presentable as possible. Much of the classer's hard work can be obviated if he will only give certain instructions and insist upon them being carried out. In reality there are only two sorts of body wool, the longer and bigger grown lambs' wool, and the smaller or shorter grown wool. Usually a picker-up has two boards with which to gather up the wool, which is

mostly so short that it will not hold together as in a full-grown fleece. In picking up with these boards, however carefully the work is done, a great amount of trimmings, stained, and fatty ends come up to the table, where the table hands do their work by taking out all faulty, dirty ends and objectionable parts. At this stage of picking up, a classer can make his own and the table-hands' work much easier by insisting that only one fleece or wool that comes from a lamb is brought up at one time, and never allow more under any pretext, so that the longer lambs' wool is kept separate from the shorter. There are really only two sorts to be made after the trimmings have been taken out of the body wool, viz., first, if of good quality, nice length, bright, and light, when it may be branded super. (In classing lambs, length and bulk are the first considerations, length being the only difference between the better sorts.) The next sort may be equally fine, as good in general appearance, but of shorter or smaller growth, being from the younger lambs, and if the best sort is called super, then this may be branded 1sts. The skirtings or trimmings of both the bigger and smaller lambs, after the stained has been removed, may be called 2nds. Bellies are usually kept by themselves if of fair growth and holding together, but if anyway bitty they may be put in with the 2nds. A classer should handle and pass all the body wool through his own hands to be certain that all the inferior and dirty pieces have been taken out. If there are more than six (6) tablehands doing this kind of work, a couple of good-sized baskets would be useful, in which to put one of the best sorts, so as to keep the classing-table for one sort at a time.

CLASSING^c BLACK OR BROWN WOOL.—If there is a quantity of this class it would pay well to make a distinction in the coloured wool. All the black fleeces, those without any traces of white or grey fibres, should be kept and made into one sort. The presence of anything but the one colour would be an objection to the buyer.

These wools are for a special purpose, and are made into a cloth used by priests and monks in different "monasteries" for certain religious services or festivals. On these festivals, the cloth has to be purity itself, a natural self-grey, produced without the aid of any dye; such wools are scarce indeed, and if a few bales of this class can be made, a high price will be obtained. Anything brown or grey can be classed if there is a sufficient quantity to make, say, a six (6) bale lot of each; if not, make one lot. The manufacturers of the now fashionable underclothing called "Sanitary, or natural wool garments," are always open to purchase these lots of coloured wools, such as brown or grey in their shades and varied colours. Sanitary clothes are made of wool of various degrees of natural greys, and are not dyed, but with the adding of white, different shades are obtained. If there is a quantity, say 6 bales or over, it is advisable to skirt lightly, putting the skirts, bellies and locks together as pieces. In a flock giving less than six (6) bales, roll neatly without skirting. Skirtings and bellies are always in demand for making the lower-dyed woollen goods, such as horse-rugs, blankets and carpets.

CLASSING ENGLISH WOOLS.

The classification of English wools on stations or farms is not so necessary as merinos, if for one thing only—that is, the quantity. No small clips of a few hundred, or even a very few thousand fleeces, would it be advisable to class; the main object is to skirt neatly, not excessively, and simply keep the hogget fleeces from the other. When handling, say, Lincoln fleeces, they only require trimming; most attention should be paid to have the stained taken off. When rolled, keep the hoggets separate from all other wools, and sell by themselves, as they are of more value per lb. than wool off older sheep. This high value rests in the extra spinning capacity of the young or hoggets' wool; possessing a

little more nature and pliability, this enables it to be spun to a much greater extent. The Lincolns are rarely found except in small flocks, ewes and wethers of different ages running together. Under these circumstances, put all into one class, calling them wethers, and keeping out the cotty fleeces. The wool will sell equally well, probably better, than if made into two or three smaller lots. The proper place for extensive classing is with the wool merchant, who comes between the grower and user. Wool merchants purchase great quantities in small and large lots, classifying the same according to the requirements of their customers and the trade generally; one class will consist of all the deepest grown fleeces, which will have a lengthy, bold, massive staple, and very lustrous. This sort will be called extra lustre, and is bought to mix with mohair for making the heaviest damasks and furniture cloths, also for making boot laces and bunting. The next lot will be called wethers, whatever sex the wool has been taken off, after the lightest and finest fleeces have been placed in a lot by themselves. Here it will be noticed that in the Lincoln there are only three lots which will be distinguished, extra lustre, Lincoln wethers, and a finer sort of fine Lincoln wethers. It is not necessary to brand with a combing, and the term clothing is never used in these deep wools, for the simple reason that there is none, although attempts have been made in that direction. The classification of the Leicesters, Cotswold and all other deep English wools is the same as in the Lincoln. The Downs breeds are treated a little differently. Firstly, the first year's fleeces are kept to themselves, and branded South Down or Shropshire Down tegs, as the case may be, which represents the finest combing wool of England, and which is often much finer and a far better wool than that grown on some of the strongest breeds of merino. The ewes' wool is kept by itself, being much shorter than the tegs', and is of greater value as a clothing or hosiery wool. The wethers', if of a combing length, are branded wethers only. Generally the classing of English wools should be

confined to as few classes as possible. In middle and deep wools put ewes' and wethers' together, calling the lot wethers', and never use the terms combing or clothing when branding the bales.

When classing English lambs' wool in quantity (excepting the Downs), make two sorts, keeping all the strong, hairy-stapled wools by themselves, and calling them 2nds and the other 1st lambs. Of course, the dirty ends and bellies must be kept by themselves.

DUTIES OF A WOOL-CLASSER.

IN connection with the wool-classer there are many different duties which belong to his office, and for which he is responsible. These duties may be called minor matters, and a great number of classers will not go out of their old orthodox methods, but consider themselves simply the classers of fleeces, and nothing more. All this old system is gradually changing, and now most station-holders and managers expect something more, for they have learnt through experience that other branches must be looked to before the fleeces reach the classing-table. It is the duty of the classer at the present time to have control of all the hands, from the picker-up right up, until the bale is turned out of the press. One of the most important things is to have an understanding with skirters, rollers, piece-pickers, down to the picker-up, for on their several branches depend the proper getting-up of the clips. After the wool-room, even the shearing floor must be thoroughly prepared for the work by having tar pots fixed securely and filled, the sheep pens and the shearing board swept perfectly clean, ready to receive the sheep and to guard against the wool becoming dirty or soiled. It is next necessary to see that the table-hands do all the repairing of the wool-tables and fix curtains round, reaching well to the floor, in order to keep in the locks ; also, if the bin-room is insufficient, to have old packs suspended by either rope or wire, in which to put the lower sorts, thus avoiding a dirty floor and trampling on any loose wools that may happen to fall. When

this preliminary work is finished, a clean sweep should be made from end to end of the shed. When shearing has commenced it will repay the classer handsomely to show all hands how the work is to be done.

The picker-up must be given to understand that a great deal of good or bad work on the rolling-tables depends upon him. If there is careless and slovenly picking up and throwing out, then the skirters and rollers will find it an impossibility to do justice to skirting and rolling. As the shearer is finishing shearing or clipping off the fleece, the picker-up should be in position, and as the sheep is let go he should straighten the fleece out, which should have the flesh or newly-clipped side upwards, and the staple tips or outside downwards. In picking up, the commencement is made from the neck, pushing up until the britches can be reached without standing or trampling on the fleece. The picker-up should hold the britches, one in each hand, and give a little shake so as to free them from any loose, dirty locks and stained ; then gather up the whole fleece, still retaining hold of the britches.

HOW TO THROW OUT A FLEECE.—At this stage often there is much mischief done by not throwing out the fleece straight and as carefully as it should be, thus causing much extra work in skirting. In throwing out, the front part should be let go from underneath first, the britches being held until the whole fleece is spread out, then they are released. The fleece should not be unduly stretched, but kept as nearly as possible in its natural shape. Through stretching, the skirters have fully 50 per cent. more ground to go over when skirting, taking 50 per cent. more time. Again, when a fleece is stretched the staples are opened, the wool appears thin and open when rolled, which militates against the sale. On the other hand, when the fleece is spread out near to its natural size, the skirters can do their work expeditiously and thoroughly, and when rolled it appears more compact and dense, the staples have their natural formation, and give a more inviting appearance, which at once commends itself to

the buyers, who will always take such a fleece in preference (all other things being equal) to the apparently open, loose-grown wool. Skirting comes next, and gives more trouble to those responsible than any other work in the wool-room; but, if properly done, the value of the fleece is enhanced, buyers always favouring a well got-up clip. Experience has taught me that there are two kinds of skirter required, one for the fast hurry-scurry Western sheds, where pace is everything, and the other on the average-sized sheds, where quality of work is the first consideration, and quantity next. It has come under my notice on many occasions when table-hands have gone to early sheds first, that two have had to skirt and roll for twenty-five or thirty fast shearers; the pace being so rapid, something has to be missed, and that is generally the skirting. (It would be far better not to skirt at all, than partly skirt.) When these table-hands have gone to the later sheds, where good work must be done, they are some time before they get into the way of carefulness and quality of work, and the complaint has been that their pace was too great for good work. If a skirter and roller can properly keep the fleeces clear from seven or eight shearers, he is doing good work, and if called upon to do more he must miss some part of this work. When skirting a clean fleece—one free from seeds and burr—it is necessary only to take off a little of the inferior grown wool all round the fleece, in other words to skirt lightly, but not to miss any part. If the fleeces are burry on the edges, shoulder-points, britches, it will be necessary to take all off, or skirt those heavily. When the whole of the fleeces are burry or seedy it is necessary to trim, taking off nothing but the very dirty, fatty, and stained ends. Before rolling, tar brands must be taken out by themselves, to be clipped off when a convenient time arrives, such as rainy days, or when waiting for sheep.

HOW TO ROLL A FLEECE.—There are several ways to roll a fleece, but only one right way. The usual method is to throw in a little of the neck, then the sides, and commence

rolling from the britches. Although this may be considered the acknowledged proper way, there is a great objection to it. It is a well-known fact that if there is a weakness in our sheep it is to be found in the back, which is the first place to look for that defect, and is found in the greater part of our flocks. What do we find when a fleece is rolled by throwing in the neck first, then the sides equally? Simply that the most defective part of the fleece is most exposed to the buyer, who will no doubt be guided thereby when making his valuation. My contention is, that a woolgrower, through his wool-classer, has a perfect right, as exercised in all other trades, to show his wares in the shape of wool to the best advantage, as long as he does not add more to the fleece than has grown on one sheep. The manufacturer who buys the wool, when he has made it into yarns or fabrics, places such in the best presentable form, so as to realise the best prices. It may be said that the buyer will find any defect in the wool! Let him find it! and do not point it out to him by exposing unconscientiously a small patch of the back, or, worse still, the wither wool, which would be the most prominent when the fleece is rolled as above. However small the defect, the buyer would take advantage of it.

HOW TO ROLL A FLEECE TO ADVANTAGE.—After the skirting is accomplished, throw over about two-thirds of one side so as to cover well the back or weak part, then again throw in a second time the same side. This second throw over will expose the whole of the back from the neck to the britch, and the underneath will be the entire side or the best grown wool. Next pull over the other edge, then throw in the neck, so as to be able to make a secure hold when fastening the fleece. Now commence at the britch to roll towards the shoulder and neck, and it will be seen that the back is gradually being folded inside, and that the well-grown side is the most exposed, as it should be. When rolling, take care not to unduly stretch the wool, and when near the neck, with the right hand draw out a small piece of wool, give it two twists,

so as to make a tassel, and with the left hand make a small hole in which to put the tassel. Never put in the tassel straight, as it would easily come out, but crosswise, so as to make a secure hold. The fleece rolled in this manner will show all the good wool, whilst the back is in the centre and out of sight. This method of rolling is followed on many stations where our best-got-up clips come from, and can be done as expeditiously as the ordinary way, which invariably exposes the wither wool, which is the most faulty in the whole fleece.

AS TO FASTENING FLEECES.—There are occasions when it is not necessary, *i.e.*, on stations where there are sheep of high standing, and not many thousands, such as the “Tasmanian sheds,” where the shearing is thoroughly carried out. Under the circumstances, the fastening of fleeces is a mistake; the wools being fine, very dense, and not a great length, any attempt at fastening thereto only tears the fleeces, making them both ragged and unsightly. These fleeces can be rolled as above, but not fastened; then put into bins carefully side by side, like laying bricks, and, as they do not come off at a great rate, pressing is not an urgent necessity. Fleeces thus placed in a bin—say, 24 hours—when the animal heat is lost, the pressers can take them up like blocks of wood, and place in the press without any inconvenience. The most objectionable fastening of fleeces is by twine, or any kind of string made of vegetable matter. There have been many complaints ever since tying with twine was introduced, and, however careful the wool-sorter is, twine will find its way into his sorts. However small it may be, when it once passes through the scouring process, it invariably finds its way into the piece. Frequently, as it passes through the several delicate machines, it does damage to them, and when it gets into the piece of cloth it shows out, when the cloth is rejected. The use of twine for fastening fleeces has caused complaints to be made by the highest authorities, committees of Chambers of Commerce, and it is a pity that

those using twine do not fall in with the requests of their best customers. Moreover, twine costs money, and time to use it. As regards "tar," it is better to take the brand out. The roller should see to this before rolling the fleece.

A word of advice to the wool-classer. Never make a valuation of the wool passing through your hands. It must be remembered that fleeces, and even the lower sorts, never look so well, so full of bloom, as they appear in the bins just off the sheep. The colour is at its best, the fleece looks bold and lofty, and so has a more inviting appearance than when they have been passed and knocked about in transit. Many clips have a tendency to lose colour to a slight extent, especially those grown on the exposed Western runs, and a classer would be very bold to give the same valuation in the wool store as he would on a station. The danger of a drooping market also must be considered, for when a classer once makes or gives a valuation the owner generally takes it as a criterion. If the results of the sales are not something near the prices named, there is a tendency to put the classer into a rather awkward position, as his employer would very probably question his abilities. Wool-classers, take advice, and do not give a valuation when on the station.

PIECE-PICKING.—In piece-picking, to do the work as it should be done, one man, if competent, should do for about every ten shearers, and he will find that there is no time to waste to keep the floor clean. This work causes both owner and classer a great amount of trouble, as a good hand is a rare commodity in a shed. There are piece-pickers and piece-pickers, and if a manager is so fortunate as to secure a good man, he should, under reasonable circumstances, try to keep him, even at a slightly-increased wage. There is a great deal of money lost in the pieces, more especially if there is a tendency on the part of the management to draw the number of hands too fine. One hand more is always safe, whilst one too little will cause the work to be done in a slipshod manner, when the owner will certainly be the

sufferer. In a team of six piece-pickers an extra hand is really necessary when the ewes are being shorn, on account of the extra stained parts found amongst the skirtings, which, above everything else, must be picked out, or the whole lot will suffer. Well got-up pieces are keenly competed for by the buyers, let them be British, Continental, or local scourers, and carefulness in their preparation certainly adds to the wool account of the producer in a most satisfactory manner. The piece-pickers should have sufficient room, so as not to be forced to become cramped; let there be sufficient elbow room, so that they may not interfere with one another.—A table six feet by four feet with a rather wide mesh of wire is used; if rollers, they should be an inch apart. Then, as the pieces are being passed over, they will to a great extent free themselves of the dirty and much stained ends, and so facilitate the work very much. When the skirting of clean fleeces is done properly, there will be no need of a broken sort, as the pieces of skirts will not be sufficiently large to make that sort. Therefore the best sort will be 1st pieces, which should contain nothing but the longest of the skirts, and be perfectly free from stained or low dirty ends. To do this work to advantage, and also save much time, there should be one large wool-basket placed between every two skirter, to be carried to the piece-packing table when full. There is a great advantage in having baskets, as the pieces are thrown in as they are made, and so do not get entangled or rolled about. When the baskets are emptied on the table, the pieces are easy to handle; being loose and free, they can be passed on much more expeditiously. On the other hand, when there is a great display in using the broom, the skirts, being turned over and over, become very much mixed and entangled. This, together with the continual trampling on the pieces, detracts from their appearance, making them bitty, dirty, and altogether unsightly. The 2nd pieces will consist of all the pieces which are not sufficiently large to go with the firsts and too large to go through the screen or between the table rollers,

which should be made to revolve and not be stationary. In the second place, much attention must be given to the stained, by having it all picked out, leaving the sort all one color, and not a mixture of white and stained wool, which will detract from the value considerably. The shearing board sweepings should be treated separately, and on a smaller side-table, as there is a greater quantity of trimmings, dags, etc., than in ordinary locks, which, if allowed to be put over the piece-table, would find their way into the locks, and this would lessen their value. These board locks, to be done quickly, should be brought up to the table, when all the large pieces should be well shaken and put on the piece table, when anything not passing through can be put into the 1st pieces. When the stained is taken out, all remaining can be put into the 2nd pieces. What is left on the floor can be thrown on the table, worked well over the screen, and what does not go through after the dags are picked out can be put in the 1st locks. The small bits that have fallen through this table can be pressed by themselves, and are called 2nd locks; and the lots under the skirter's and piece-picking tables being cleaner—that is, freer from discoloured small trimmings—should be kept by themselves, making a distinct sort. It will be necessary, when taking the locks from under the table, to see that all the dags and stained are taken out.

SORTING BELLY PIECES,

There is still one more important matter coming under the jurisdiction of the wool-classer, which will add to his reputation as a careful tradesman, and that is improving the belly wool. Belly wool is about the best neglected sort in a shearing shed. Care is bestowed promiscuously. It is picked up and thrown into a basket, or sometimes a loose old pack, and when it is full the wool is taken to the press and baled straight off. This is one of the greatest mistakes that any pastoralist can make, for with a very little care (a boy

can do the work) this wool can be made worth pence a lb. more than if neglected. The sorting of belly wool was, I may claim, introduced into Queensland by myself on many of the largest stations, and in one year upwards of a half a million of belly pieces were sorted by my employees and myself. Ever since my connection with the wool trade in these colonies (18 years) the same principle has been carried out, whether on stations or at the college. When I supply stations with wool table hands, any owner or manager who neglects to have his bellies sorted has himself to blame, as the least and youngest student is very capable of doing belly pieces for over 40 shearers. Several station-owners have been advised to have this class of wool just simply trimmed, the short, loose, dirty ends skirted off, the long stapled bellies thrown into one stack or bin, and the short into another sort, calling them 1st and 2nd belly pieces. This getting up of belly wool is gradually but surely gaining favour, and will pay a great bonus for the very little outlay in labour. The skirtings are passed over the screen, and what does not fall through into the locks underneath should be put into 2nd pieces. The stained finds its way into that sort. It is not requisite to go into elaborate sorting, neither is it necessary to have many different lots of bellies, hoggets, wethers and ewes. By taking the stained out of all wether bellies two sorts are all that are required—1st or long, 2nd or short. If the wool includes some free and some seedy or burry, as we find sometimes, make a free sort, and let the seedy go altogether.

WOOL PRESSING.

The responsibility of wool-pressing rests with the classer, for it is he who is blamed if twine finds its way into the wool, or if there are unsightly or uneven bales, and bad branding. A classer should have an understanding with the wool-presser; firstly that he must never take the wools out of two bins and put them into one bale without acquainting him; nor, secondly,

allow the packs to be cut down (which must be done to make them fit the press) inside the wool-room, as there is always a great danger of the cuttings getting mixed with the wool; nor, thirdly, allow any part of the pack to be cut off and put into the bottom of the pack in the press. This is work which is not necessary, but if allowed will most certainly cause much of the ravellings to become mixed with the wool, eventually finding their way into the piece of cloth, which, when dyed, shows two colors, since the vegetable and animal fibres will not take the same dye; consequently the merchant rejects all such goods, causing many a serious loss to the manufacturer; this, together with damage often done to the delicate machinery by even small pieces of string, should be pointed out to the pressers, so that all such evils may be avoided. If there is one thing manufacturers object to above all others, it is to find twine mixed with the wool they have bought, and as they are our best customers their complaints should receive every consideration. Within the last few years these complaints have been numerous.

Branding the bales also comes under the control of the wool-classer, and this should be done distinctly and simply, but giving as much information as possible to the buyers. Frequently the heading consists of the name of the station, with the owner's initials or numbers beneath, then follows the sort of wool, lastly the number. The manner of naming the sort is the most particular thing with the buyer, who, having several catalogues amounting to hundreds of lots to go through in a single morning, naturally wishes to see something on the bale which will guide him and save as much of his time as possible. To meet his wishes and convenience, the bale should always be branded 1st, or 2nd, or super, according to the class of wool it contains. If branded 1st combing, *e.g.*, there is at once something definite, and the buyer knows what to expect. Coming next he sees 2nd, which at once indicates that the wool is inferior to the 1st. If super is on the bale it is sufficient information

to give him to understand that there is something better than that in the 1st combing. Using letters to show the difference between the sorts or classes is unwise, for the buyer has to spend much time in finding out the many qualities under AA, B, C, and so on. If a lot is branded "A combing," how is a buyer to know whether the wool is better than wool branded AAA? One would imagine that wool branded with the most letters would be the best, but they may be and they may not. Using letters instead of the straightforward business-like 1st and 2nd only confuses, and does not give any definite information to buyers, who may have to value probably up to 1,000 lots in a single morning.

WOOL-PRESSERS.

All wool-classers have full control of the pressers and pressing, for several reasons. The pressing-room is a place where a great deal of damage can be done to the wool after it has been most carefully treated at wool-tables and classed by classers of the highest repute.

In the first place it is necessary for the classer to see that the entire room, from the very back and sides of the wool-bins to the bale storing-room, is thoroughly cleaned, and all rubbish thrown out well away from the building or shed. Capable pressers will then give their press a thorough overhaul, paying strict attention to the mechanical parts, scraping off all old grease and rust, tightening the bolts, and oiling all joints and pulleys. Packs have to be cut down a little, so that they will fit the lower box, but the cutting-down under no circumstances should be allowed to be done within the walls of the shed, but outside, so that all the loose cut twine is left outside, lest it should find its way into the wool. The buyers have as great an objection to the small twine as they have to that used for tying the fleeces. Another bad practice is to allow the pressers to cut off any part of the pack and throw into another pack in the press. Keep the pack intact, the

sewing can then be more securely done. The practice of cutting off parts of the pack is followed in order to save time ; but it is an open question whether any time is lost by keeping the pack whole. Again, when these pieces of ravelled hemp or jute packs are put in amongst the wool with the idea of saving a few ounces of weight, which is the first consideration of most managers, they scarcely ever give a thought to the damage likely to be done to the whole lot of wool by including these worthless pack-rags or ravellings. Frequently classers are blamed for the irregularity of a bale or two in a large lot when really they are not in fault. To protect himself, the classer must give the pressers to understand that under no circumstances are they to take fleeces out of any bin but the one containing the class of wool being pressed. It frequently occurs that pressers will, on the sly and without asking permission, go into another bin containing another sort of wool and fill up the bale, so as to avoid delay. When that bale is examined it is found to contain two different classes of wool, when the unfortunate classer is condemned for bad classing, whilst the pressers by their underhand work come out free at the expense of someone else. A classer will profit much by having a timely conversation even with the pressers, for it is in their power to do him a great deal of damage, and spoil his reputation as a tradesman. It will be also an advantage to the classer to pay a little attention to the handing of fleeces to the press. However simple this may appear, buyers do like to find the bales nicely pressed, which often gives them confidence when valuating a lot of wool. Careful and systematic pressing implies that a general care has been bestowed in the getting up of the clip. Sometimes a man will go into a bin of fleeces and take up as many as he can gather in his arms, then rush to the press, putting the whole into the bale in a confused mass ; under these circumstances the bales when pressed come out in a most irregular form, some parts extremely tight, whilst other parts will be loose and flabby. But the

damage does not end here, for when the bales are opened for sorting or otherwise the fleeces are entangled, so that they have to undergo a great deal of teasing about, which damages the wool for sale, and, worse still, the unfortunate sorter finds the opening and sorting very perplexing and difficult, so that he can never make his sorts look presentable. Fleeces should be handed in singly to the presser, who is tramping the wool, and should be arranged or placed side by side, one tier at a time, then trampled well, and so on until both boxes are filled. When the bale is opened, the fleeces, being in layers, will come out intact, and fit to show any buyer, and fit for any sorter to open and sort to the advantage of the wool and himself.

TECHNICAL TERMS USED IN WOOL-SORTING.

MERINO COMBING WOOLS.

COMBING.—Wools of a suitable combing length to distinguish it from a clothing.

MATCHINGS.—A name given to the different sorts and parts of fleeces when they have been divided or sorted.

SUPER COMBING.—Denoting that the wool is of a high and fine quality; the shoulder parts of a fine fleece.

1ST COMBING.—Wool taken from the sides of a fine fleece, and the shoulder of a fairly fine fleece.

2ND COMBING.—A sort made from the shoulders of a fairly fine fleece, and the shoulders of a good fleece.

3RD COMBING.—Taken from the sides of a good fleece, and the shoulders of an average fleece.

4TH COMBING.—From off the sides of an average fleece, and the shoulders of a strong fleece.

5TH COMBING.—The wool off the sides of a strong fleece.

6TH COMBING.—Wool taken from the lower part of the thigh, and called britch or bindles.

It is not a general custom to name the sorts of matchings by numbers ; different firms have names. For instance, one firm will name sorts 1's weft, 1's warp, or A weft, A warp. Others will call the sorts according to their spinning qualities—60's, 66's, 70's, etc. As the sorter sorts his wool to certain qualities, whatever may be the difference in the names, the real meaning is the same for the purpose.

PICKINGS.—Are the moits picked out by the sorter, consisting of straw, thorns, twigs, seed, leaves, or any vegetable matter.

FRIBS.—All the small or second cuts shaken out of the wool.

The above-named sorts constitute the different assortments of wool as required by the manufacturers of the finest down to the lowest woollen cloths, even to floorcloths and carpets.

TECHNICAL TERMS USED IN MERINO SHORT OR CLOTHING WOOL.

PICKLOCK.—Taken from the choicest part or shoulder of a very fine fleece.

PRIME.—The sides of a very fine fleece, and the shoulders of a fine fleece.

CHOICE.—Best part of the neck of a very fine fleece.

SUPER.—From the back across the loins to neck of a very fine fleece.

FINE.—The best of an average fleece.

COARSE.—The lowest sort, consisting of the britches of the fine fleeces and any low-grade fleece.

HEAD.—Wool taken from the head, commonly called top-knot.

All the above names are given to the different sorts into which the fleeces have been divided, and go under the name of matching. For example: Picklock matching, which implies that it is soiled fleece wool, and not skirts or pieces.

TECHNICAL TERMS USED IN SORTING MERINO SKIRTINGS.

DOWNRIGHTS.—Name given to the best of the skirtings taken from the front part and sides of the fleece, frequently including the bellies. The fleece must be fine.

SECONDS.—An ordinary sort, consisting of a coarser wool from the skirts, otherwise than the britches.

ABB.—The lowest sorts of skirts, the coarse edges of the britches.

SHANKINGS.—Short, bitty, and very coarse wool and hair shorn off the legs.

TOPPINGS.—Dags and tar brands, cut or clipped off by the sorter. Ordinary sheep shears are used.

WOOL-SORTING.

WOOL-SORTING is the dividing of fleeces into the different parts or sorts it contains, each sort being of a different quality, so that a manufacturer can spin it into an even, regular thread or yarn. This term is frequently used when speaking of wool-classing, but there is a wide difference between the two, sorting being a more advanced and more scientific work. To compare the two, classing and sorting, one would have to say that the former was placing the fleece as a whole into classes or grades, whilst the latter is opening the fleece and separating or tearing off, sorting it into as many sorts as it contains. It will thus be seen that there is a wide difference between the two professions. A qualified wool-sorter is always the most reliable wool-classer, but wool-classers, in 90 per cent. of cases, cannot sort wool, which is a much more advanced trade. To be correct, the sorting of wool is not necessarily confined to fleece wool, but to wool in all stages, as scoured, long, short, from locks to the finest merino, and to the longest Lincoln. When

sorting for the manufacturer, it is done in a room specially adapted for the purpose, generally detached, or otherwise separated from all other work.

All the tables are arranged on the sides of the room under the windows, as light is one of the most necessary requirements, and no good work can be done without it. Each sorter's table is about seven feet by three-and-a-half feet, and placed directly opposite a window, and has a partition at each end so as not to interfere with fellow-workmen. Under the table there are three or four small bins, into which are put the smaller sorts; if merino, the skirts, even if the fleeces have been skirted on the stations, are looked to, and any short, bitty, or inferior grown wool is taken and sorted into generally four sorts, called shorts, each firm having names of their own, sometimes first, second, third; other firms will call the same sorts superfine, super, fine, and low, and so on. In the fine English wools these skirtings are super, taken off the edges of the best part of the fleeces, shoulders, and bellies; downrights, taken off the side edges; seconds, towards the flank, and abb, off the britch. They may have been taken off 20, 50, or 100 bales of fleeces. Provision is made for the larger or more bulky sorts, in the shape of large skeps or baskets, one for each sort. Where the best work is done, the sorter has his bale or sheet of wool (the latter is the name given to pack containing the wool, which is about 6 feet by $3\frac{1}{2}$ feet) weighed on; it is then taken and placed conveniently near the sorter's stand or work space. The fleeces are then taken out of the pack and opened singly, each one split down the centre of the back, when it is gathered up separately, staple side up, commencing generally (although there is no hard and fast rule) at the neck down towards the lower part, when the britch is thrown over the half fleece. The half fleece being gathered up in this way one piece is placed on the floor, side or lengthwise to the bins. About six fleeces will form the bottom tier or row, and so on, others are built up until the day's work

has been opened, which is called a pile or stack. During the process of opening, which is done on the floor and not on the tables, each part or half fleece receives a gentle shake to free it of any loose pieces, etc.; these are picked up, (not swept up) by hand and placed on the table, after which the floor is carefully swept, and must be kept clean when there is no fleece-opening going on. The sorter now commences his business of sorting, dividing the loose pieces picked up off the floor, into the required sorts, and, being generally short and small, they go into the different partitions under the table. This done, and the table or board being clear of any loose matter, the sorter commences by taking one-half of a fleece by the back just as it was laid on the pile, throws that part from himself towards the window. The edges of the half-fleece are now conveniently in front of the "operator," who commences to take off what are called "shorts" all along the side. These are now sorted into different qualities and put in to their respective bins under the table. The half-fleece is now ready for sorting or dividing; the commencement is mostly made at the britch, by taking it off and throwing it into the basket containing the lowest sorts. The flank comes off next, and is put into a skep and thrown into another skep. The rump is next attended to, and put into another basket. If the back is at all inferior in quality or condition, it is cut out and placed separately; sometimes the backs are divided into two sorts. There are now left two of the last or highest sorts, the shoulder and side; when the former is now separated from the latter, with which occasionally a front or neck part is put, each sort is put into their respective baskets. Thus the whole pile is treated; and scores, sometimes hundreds, of bales are thus treated and sorted into the sorts mentioned, each basket containing a sort, even in quality and other respects, which are now called "matching." It is often argued that a "sorter" makes a greater number of sorts than a "classer" does when classing. It is not often that there are made more than six

sorts of "matchings" and four of shorts—in all, 10, out of a lot of wool comprising 100 bales or even more. How many sorts will a "classer" make on an average station, say, of 50,000 sheep? There will be 1st and 2nd combings, and clothing, probably super sorts; then comes condition and a lower sort of objectionable wool, besides 1st and 2nd pieces, stained and locks—in all, as many sorts as a manufacturer would make. An entire clip could be sorted into as few sorts by practical wool-sorters as wool-classers will make of fleeces, but not so quickly, although I have had four wool-sorters, assisted by four ordinary table-hands, sort into qualities, and pick the fleeces also for 30 shearers, and keep the floor clean. In the time it takes a skirter and roller to fix up his fleece, a sorter will have his fleece skirted, divided into sorts, and thrown into their respective bins, thus saving a great deal of skirting and rolling trouble, which is always an annoying part of the shearing. Many, who have never visited a proper sorting-room, have little idea as to the expertness of the wool-sorter, who, in rapid succession will take up the half fleece, have it divided, and each sort put into its proper place. Still greater the surprise when they find in each basket large and small pieces, every one matching the other in every respect, each sort being an acknowledged spinning quality, and bought as such. To watch a sorter is very interesting, for it must be remembered that in all clips there are no two fleeces exactly alike. But the sorter has to make one sort of the same quality, however many pieces of wool there are in that particular sort. Quickness in decision (first impression is generally correct) good eyesight and sensitive touch, aided by a good, but not brilliant, light, are essentially requisite to make a thorough tradesman. When a sorter possesses these qualifications, it is no trouble for him to see at a glance, when the wool is unrolled on his table, where the different sorts lie, and where he has to make his divisions. Sometimes a fleece will contain a small portion, perhaps the size of a pocket-handkerchief, of the best sort, while the lower sorts will consist of

larger pieces. Another fleece comes up (a finer one), probably half of this will go into the best sort, the lower sorts will have smaller pieces, and in such case the lowest part or britch will be sufficiently fine to be placed in the lowest sort but one. It is this irregularity of the size of the various pieces cut out of the different fleeces that causes a man with half or little knowledge to study, and even wonder, how a sorter can divide fleeces so expeditiously and still have sorts even. The work is not exactly completed when the wool is sorted out; but is passed on to another sorter, called a "looker-over," whose duty it is to inspect generally, over a table, each sort separately, and take out any pieces which are either too good or too low for the quality under treatment. If there is too much contrary wool in one sort it is generally sent back to be done over again. This is called "sweating."

TECHNICAL TERMS USED IN SORTING ENGLISH AND CROSS-BRED WOOLS.—LUSTRE AND DEMI-LUSTRE MATCHINGS.

SUPER.—The very finest part of a demi-lustre fleece.

FINE.—The best part or shoulder of an extra-fine lustre fleece, generally 40's quality or counts, and above.

BLUE.—The shoulders of an average lustre fleece, Lincoln or Leicester, of 36's quality or counts.

NEAT.—The sides of an average lustre fleece, of 32's to 34's quality or counts, according to the style of the wool.

BROWN.—Mostly from the flank, a sort coming between the neat and britch, 28's to 30's quality, according to style of wool.

BREECH OR BRITCH.—The wool of the thigh; in a good-bred fleece, the britch or the lowest part, of 26's to 28's quality.

COW-TAIL.—Is the lowest and roughest, or the britch of a very low lustre fleece, quality or counts ranging from 20's to 24's. This is the lowest matching sort.

TECHNICAL TERMS GIVEN TO THE SHORTS OR BROKES OR SKIRTINGS OF THE BRITISH AND FOREIGN COARSE WOOLS.

FINE.—These are found only on the skirts of the finest British and foreign cross-breds, and are taken off the shoulder points, the neck, and sometimes sides; frequently the belly wool is put in, but it must be fine.

DOWNRIGHTS.—Are the shorts taken mostly from best parts of the fleeces of the middle British breeds, a sort rarely found on the Lincoln and Leicester fleeces.

SECONDS.—This sort consists of the best shorts or small skirtings of the lustre breeds, which is lower than the down-rights.

ABB.—Short bits or trimmings of the britch wools; it is very coarse.

LIVERY.—A lower sort than the britch, consisting of the short bitty cow-tail, and the wool clipped off the dags. It is generally a little stained.

SORTING ENGLISH WOOLS.

The actual operation of sorting English wools differs very little from that of the merino. In the British and American factories the sorting of the merino is considered almost a separate branch or trade, and when the tradesman has devoted the greater part of his time to it, he is rarely suitable, in fact, he may be said to be an incompetent hand when manipulating any other class of wool. It is just the same with a sorter of the heavier English wools, who, after handling the great lengthy strong grades, appears very much out of place when sorting the fine and more sensitive merino wool, which requires a more delicate touch. The British wools are in great variety, from the finest Downs and Welsh,

to the lengthy Lincoln ; therefore, there are a great many different qualities for the sorter to contend with, and he is expected to be able to sort correctly all breeds of domestic wool.

The sorting of the lustres and demi-lustres may be called the heavy or hard work of the sorter, as the wool is so strong and long that it requires a good amount of strength to sever the different qualities of the fleece. There is the same procedure in opening the fleeces as explained in Merino wool-sorting, when the half fleece is thrown on the table. The first part of the business is to take or skirt off any inferior-grown or dirty short skirts, which are few. These are sorted into their respective sorts, which are mostly of the lower qualities, seconds, abb, and livery.

There is no fixed principle as to which end of the fleece to commence with, the britch or shoulder ; but very often, we may say mostly, the sorting commences at the britch. This, of course, is the lowest part of the fleece, from which it is severed in quick time, and thrown into the basket reserved for that particular quality, which is always a spinning quality. The next sort is from the thigh, which is likewise torn off the fleece and placed according to the quality. The flank receives due attention, and quickly finds its place in the basket. This now leaves the side and shoulder, which are divided according to their respective quality. Although sorting is a most particular operation, a good tradesman will sort his fleece and have his table clear quicker than a shearing-shed table hand can skirt and roll his fleece. In this manner all the different classes or qualities of the British domestic wool are prepared for the manufacturer, varying from 20's to 56's spinning quality.

WOOL-STAPLER.—A wool merchant.

STAPLER.—A wool merchant who buys and sorts wool before selling it to the manufacturer.

TOP-MAKER.—Is a wool-stapler, who, after having his wool sorted, has it combed into sliver, then rolled into a large ball or top ; afterwards sells it to the spinner or yarn manufacturer.

SPINNER.—One who spins combed or carded wools into a yarn or thread.

MANUFACTURER.—One who manipulates wool in all the stages to produce a piece of cloth.

A PACK OF WOOL.—240lbs. net of wool.

FADGE.—Less than half a bale of wool ; an irregular package of wool.

BUTT.—A smaller package than a fadge.

TECHNICAL TERMS RELATING TO THE WASHING OF WOOL.

WOOL-SCOURING.—Denotes the passing of wool through a process of cleansing by the use of hot water and soap.

WASHED FLEECE.—Meaning that the wool has been washed on the sheep's back before shearing. This is an out-of-date process, as the sheep were subjected to unnatural treatment, by first being crowded into a sweating-room, afterwards put under spouts, from which there was a weighty fall of hot soapy water. This to the sheep was a distressing process, often causing serious loss in sheep.

GOOD NOSE OR SMELL.—A term frequently used to denote that the wool has a pleasant or natural smell; is a sign that the wool is in good condition.

LIQUOR.—A term used only amongst wool-scourers, meaning that the scouring agents, soaps, etc., have been dissolved and made ready to mix with the hot water in the soap tank, which, when blended, is called liquor, or scouring solution.

DRY.—When the wool has a dry or harsh touch, or devoid of the natural woolly feel.

FREE.—When the wool is free from seeds and moits.

CLAMMY.—A wool having a heavy, greasy, claggy feel, the result of not being thoroughly cleansed or scoured.

ROPEY.—Implies that the wool, in the process of scouring, has been allowed to become twisted into rope-like lengths.

GREEN-NIBS.—Are the tops which have not been thoroughly squeezed (the water remaining in them), which, when dried, have a greenish tint.

SPECKY.—Implies that the scoured wool has become speckled by small specks of dirt or uneven in colour.

CANARY.—This is what may be called a new term in scoured wool, and is used mostly in Western Queensland. It really means a slight yolk stain, and is evenly distributed through the wool when washed, giving a delicate yellow, from which the name of canary is derived. Although the wool is of a pleasing appearance, it is faulty, especially for dyeing purposes, and will take only those dyes darker than the discolour.

SORTING FOR SCOURING.—There is no necessity for elaborate sorting when the wools are going to the scour, as when the skirtings are taken off, the fleece is fairly even. However, at least three sorts of combings and three of clothing are necessary to suit the trade. The great drawback to our merino wool, especially on the Western stations, is that the backs suffer through the sun and dirt, causing them to be very thin, light, and rough. They should therefore be taken out of every fleece, and thrown into a sort by themselves. This is most expeditiously done after the skirtings have been removed, by throwing one side or half the fleece equally over the other, so that the edges of the fleece are even or equal. The back in this position is near and convenient to the sorter, and can very easily be seen on account of its thin and dirty growth, which can now be cut out by the hands in one sweep, taking the whole back out at once. The combings according to their quality can be made into three sorts, by taking the front part or shoulder for the fine or first, the lower part put amongst the half of the middle fleeces, and the lowest sort would contain all the lowest fleeces together with the lowest part of the middle fleeces. This plan can be carried out in the clothing. The above method of sorting can be carried out to better advantage if there are large quantities.

WOOL SCOURING.

The object of wool-scouring is to thoroughly cleanse the fibres from all impurities, seed and burr excepted, without damaging the minute and delicate scales, or serrations, or the internal cellular structure, also, at the same time preserving the natural colour. The physical properties, which are very sensitive, require most careful treatment, so as to leave them in a perfect state after passing through the many different processes to which they are subjected, if satisfactory results are to be expected. The preservation of the natural colour is of the greatest importance; firstly, to render the material to be dyed as clean as possible, in order that the aqueous fluid afterwards applied may be absorbed, and that its contents may adhere to the minute internal surfaces of the serrations and cells; secondly, that the material may be rendered whiter and more capable of reflecting the light, and, consequently, enabling the colouring matter to exhibit more brilliant tints.

If we take into consideration what is dependent upon good scouring, it shows how all-important it is to have this branch of the trade most skilfully executed.

There is no doubting the fact that, generally speaking, wool-scouring in these colonies does not receive that attention the industry deserves; quantity of work, and not quality, apparently receiving the greater consideration. The methods of treating wool may be said to be, in the majority of cases, dangerous, often leaving indications of injury to the delicate structure, sometimes even the partial destruction of the colour. These are serious defects, caused in part by want of knowledge on the part of the responsible person, who does not give proper attention to temperature. This is not to be wondered at, when we see such operators disregarding entirely the introduction of any appliance for the regulation of temperature, or for meting out uniform treatment. Such men seem to have a

great objection to the use of a thermometer, and resent any suggestion as to its use, but prefer to rely upon the old plan of immersing the hand, which at best must be a matter of guesswork. To say the least of this method, it is very dangerous, besides being most uncertain, as in the course of wool-washing there is a great necessity for dabbling in cold water; and then when it is necessary to attend to the hot water for soaking purposes, the sudden change makes it impossible for the operator to judge with any accuracy of the temperature. There is also little notice taken as to the time the wool is allowed in soaking; some will be left only a few minutes, or even seconds, whilst the bulk will remain up to half an hour. Also, the scouring or cleansing agents are not thoroughly understood, and do not receive that attention necessary to turn out scoured wool in the best condition; and through neglect of these main factors, no wool can have a uniform colour, texture, or touch—properties which deserve much more consideration than they generally receive.

All wools differ in the various districts where they grow; some have a free yolk, and are fairly clean, and have a nice, taking appearance; whilst in another district the condition is heavy, the yolk of a pasty, fatty nature, so that the wool is much more difficult to cleanse. Other wools might be dusty and dry, with very little yolk. All these different kinds of wool require different treatment to remove the extraneous matter and leave the fibre uninjured; which cannot be successfully accomplished by what may be called thumb rule, a system yet in vogue at some scouring establishments, as well as on some large stations. By a relax system wool frequently becomes damaged in colour and nature, and is often subjected to severe treatment, as too high a temperature, which will partly destroy both the delicate structure and the colour. The unskilful use of caustic soda also will destroy the wool. Wool can be completely dissolved through the agency of caustic soda, when it becomes a light brown,

glutinous substance; therefore, when used, it should be placed in most reliable hands. In fact, the use of this severe chemical should be wholly discontinued in wool-scouring, as there are several new soaps, the foundation of which is ammonia, always safe to use, even by inexperienced hands. If scourers had any conception of the damage done by unskilled operators and the use of unnatural soaps in wool-scouring, the initiatory process of manufacture, there would be more consideration given to this branch of the wool industry.

The all-important object to be secured when scouring wools, is to remove by as mild means as possible all grease and dirt, so as to leave them in the best state for the manufacturer. All wools can be thoroughly cleansed by judicious treatment, but all cannot be made bright; deficiency of natural colour cannot be improved by the most artistic scouring process.

There are several methods adopted when scouring wool: from the old pot-stick and hand box-washing machines, up to the latest steam-driven machinery. Pot-stick washing, until lately, was much in vogue in the back country, but is now nearly a thing of the past, and it is far better that it is so for the pastoralist. It must be admitted that there has been real good work turned out; still, there was always a great amount of doubt, on account of the uncertainty of labour, the quality of water, and its contamination (rendering it objectionable and almost useless for other purposes), not to speak of waste or loss of wool. It is gratifying to know that this plan has been supplanted by more rational modern methods.

The hand-box system requires an unstinted supply of water, when excellent work can be turned out, equal to that of any of the latest improved machinery. This may be taken as a bold assertion, but I have only to quote actual facts, by referring to a brand D—Muckerawa, where scoured combing realised 27d., down to broken 23d. (a record price at the time). The scouring was pronounced as faultless by the wool brokers, buyers, manufacturers, and all connected

with the trade. This was the work of Messrs. Hayes Brothers, Goodooga, and was hand-washed in boxes.

Hand washing boxes are arranged in a row, with a sufficient space between them for a drainer to be fixed. These boxes are made of wood, and are generally square, of sufficient height and size to allow a man to reach any part comfortably. Inside this box there is a close wire or perforated box, made to prevent any of even the smallest locks of wool from getting out; there is also a space of two or three inches between the wire and wooden boxes, sufficient to allow for a free flow of water. The most serviceable, as well as the most expeditious kind of hand scouring box is arranged so as to let in the water from the bottom, which greatly assists by keeping the wool open, thus allowing the free action of the volume of water to get through every lock.

Special provision must be made for a copious supply of water, which is pumped or lifted into overhead tanks, 400-gallon tanks, as a rule, being used, each placed so as to supply one washer. Both in the washing and soak tanks there are valves so arranged as to expeditiously fill and empty the tanks, in order to minimize the loss of time. It is necessary to arrange for the soaking of the wool at a convenient distance from where the wool is washed. There should be two soak tanks, each capable of holding at least 200 gallons of water, this being sufficient for a bale of $3\frac{1}{2}$ cwt. to 4 cwt. of greasy wool. For heating purposes, steam jets are most convenient, whereby the temperature can be regulated without waste of time. Provision must be made for the proper dissolving of the scouring agents, which is generally done in a smaller tub or tank with hot and cold water communication, when the whole can be made into a liquid, or, as it is called, liquor. In dissolving the soap, a sufficiency for the day's requirements is most advisable; taking, for instance, 12 bales of average greasy fleece. Under these conditions, take 12 lbs. of soap of good quality, making it into a liquid not too thick, but easily handled, and with a vessel take out a twelfth part

and put it into the soak tank with the 200 gallons of water necessary for scouring a bale of wool. When the 200 gallons of water in the soak has been heated (it should be regulated by the aid of the thermometer up to 105 deg., not by the hand), then add the liquid soap, stirring well to obtain a good blend. The wool should be put into the soak open, and as loose as possible, by taking an armful at a time; it should be pressed well down, so that the wool becomes thoroughly immersed until the liquor has penetrated it, when it is said, after the proper time allowance, to be thoroughly soaked. If wool is put into the liquor in hard junks, as it would do if taken out of the pressed bales without being teased, there is a great danger of some of the tighter wool not receiving so thorough a soaking as the loose wool, when an irregular colour would be the result. The second soak can be filled in the same manner as the first, and when finished the washer may commence by taking the soaked wool out of the latter, placing as much as he can lift by the aid of a four-pronged fork on to a drainer, thence into the cleansing box, which will be filled with water running strongly. Thus the operator will keep two washing tanks going at the same time, inasmuch as the water rising in force from the bottom keeps the wool open in one tank, while he attends to the other. When the water is clean the wool is ready to be lifted out, and is placed on the drainer between the two boxes to drain. To let wet wool stand on the drainer, even a short time, is very detrimental, as both the appearance and colour are bound to suffer. Always get the water out of the wool as soon as possible, which is best accomplished by aid of a centrifugal drier, or, as it is called, hydro-extractor. This is an important matter in wool-scouring. The sooner the wool is thus freed from water the better the colour; at the same time it becomes more open or bulky, and improves in appearance, and will completely dry in a couple of hours by exposure to the sun. Wool merely drained will take fully a day to dry, when much of the water is dried in, making the colour dull, besides requiring several turns, which means extra expense and time.

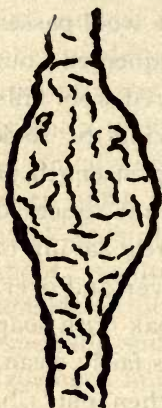
There are several patent wool-scouring machines, all invented so as to turn out the best of work in the shortest time and at the least cost. During my early colonial days, when undertaking large sorting and scouring contracts, I worked many machines of different makes, so claim to be in a position to form a good idea as to the best. To do good, all-round work, avoid a machine with quick action, especially when small belts are required to work the pulleys. Any quick action has a great tendency to knock and tear the wool about, making it appear bitty, and often ropy, which is considered objectionable by the manufacturers. Fleece wool especially suffers in value when in any way twisted or roped, causing a much greater production of noil, on account of the combs in the combing machines having to tear their way through. Such machines do much better with the smaller wools, as pieces, locks, etc. Machines with long, narrow troughs, and forks to pass the wool along, tend to rope and tear it too much; besides, it often occurs that with the confinement of the water flow all the wool does not receive equal treatment. This will impart an unevenness in colour, which will weigh against its value.

The scouring machines mostly in use by manufacturers and commission carders and combers for woollen, cotton, and silk fabrics consist usually of four long tanks or bowls, each connected with the other by a revolving apron and a set of heavy rollers. In these tanks there is a free flow of water, the whole length and breadth, so that the wool is thoroughly immersed as it is passed on by forks or rakes on to a lifting device. The first tank or bowl is generally used for soaking purposes as before described. The machine is fed by means of a rotary apron upon which the wool is placed evenly and regularly, so as to prevent any accumulation of lumps or solid masses in the bowls. The wool is thus conducted to the top of the apron, when it falls into the soak, and is immediately pressed under the liquor by a large revolving immerser. The wool is passed on slowly by the aid of the sweeping motion

of the rakes, with very little injury to the wool or water, until it is lifted on to the connecting rotary apron, which delivers it at once to a heavy set of press rollers. As the wool passes through these rollers the hot liquor is squeezed out running back into the tank, whilst the half-scoured wool falls into the second tank of cleaner water. By allowing the soak liquor to run back into the bowl, the scouring strength or capacity is increased by the addition of yolk which is squeezed out by the rollers. By this method there is a great saving of labour and material, as the liquor can be used over and over, and there is no necessity for replenishing the soak with soap for every bale. When the wool to be scoured is fairly clean, commence by thoroughly dissolving the soap, then put 1lb. into the soak, and keep up the temperature, when as many as 10 bales of greasy wool can be most effectually cleansed, fit for any market, without changing the water. In this manner all the wool is passed from tank to tank, greatly accelerated by showers of clean water, each cleansing the wool more and more. At the end of the fourth tank, as soon as the wool is passed through the rollers, with the assistance of a smaller apron, it is received by a fan which opens out the cleaned wool, making it light and easier to dry. Afterwards this wool should be put evenly into an hydro-extractor, which, when power is applied, revolves at a high velocity, removing all the water.

The most perfect up-to-date washing machines are those in which a sweeping pressure is substituted for forks or rakes. The manner of soaking and feeding is the same, the soaked wool falls into a broad long trough, with a copious flow of water, which has a ready means of escape. As the wool passes along, large, flat iron weights sweep down simultaneously, crushing or squeezing it as it passes along. This squeezing the wool whilst it is under the water loosens the dirt far more effectually than other processes, and so it is more readily rinsed and cleansed.

By substituting weights for forks, the wool is not torn, made ropy, or lumpy; on the contrary, every piece is as large and open as when first put into the machine. The whole fleece can be thoroughly cleansed, not a fibre or staple injured, every part being as perfect as if it had been just shorn off a well-washed sheep. Wools presented in this form to the manufacturer are in a perfect state, suitable in every way to his requirements.



FIBRE INJURED BY
TOO HOT WATER.

HEATING WATER.—In all machine soak tanks there should be a steam injector so as to conveniently heat the water, also to keep it at a regular temperature. It is surprising to see what little consideration has been given to this most important matter.

It must be remembered that to allow a jet of steam to come in contact with wool really means its partial destruction, both in its physical structure and colour. When soaking wool, it is extremely necessary to keep the water at the same temperature, so that equal treatment is meted out to the whole, however large or small it may be. In all machine-scouring each tank or bowl is fitted with a false bottom, made of thin iron plates, well perforated, so as to allow all sediment to sink to the real bottom, thus preventing the wool from coming in contact with sand, etc. This false bottom is in sections and readily removed, and rests upon edges about six inches from the bottom of the tank. Instead of having the steam injector above the false bottom, as it usually is, it should be arranged to come in underneath. By this arrangement the steam never comes directly in contact with the wool, as it does when the injector is above the false bottom. To further improve the heating process, there should be attached to the steam injector an iron pipe, with six or more branches or arms, each well perforated, so as to

distribute the steam well throughout the length and breadth of the tank. This steam-circulating pipe can be made so as to allow of its being easily removed by means of a connecting socket, and can be slightly raised, so as not to rest on the bottom. When the machine is working, an even temperature can be easily secured throughout the tank by regulating the steam. This is the great preventative against any damage happening to the wool in this department. From my own personal experience this is by far the best and safest method of heating water and securing an even temperature for wool-scouring purposes; it ensures a regular and even colour throughout, and protects the fibre.

The success of scouring rests mainly on the quality of the water, which should be fresh, soft, clean, and in plentiful supply. If the water is hard, as it is in localities of iron and other mineral formation, caustic soda can be used to great advantage in softening it by adding 4lbs. to every thousand gallons of water before putting in any soap.

SCOURING SOAPS.—There are many different kinds of soaps used when scouring wools, which, according to the condition of the wool, must be used in greater or smaller quantities. The base of yolk is potash, and is soluble in either hot or cold water; a sound potash soap will, therefore, act in unison, to the benefit of the fibre or wool.

Stale urine has been used from the earliest time of textile manufacture. Although there are many different scouring agents on the market, all proclaimed to be the best, yet for safety, as well as perfect cleansing properties, stale urine holds its own. It can be successfully used in the proportion of one gallon to five of water. If a stronger agent is required, add a little liquid ammonia.

The best soap for scouring purposes is that made principally of ammonia. It has a mild effect upon wool, and can be used either with hot or cold water, according to the condition of the wool. In the great textile manufacturing

centres in the North of England, it is almost universally used for cleaning wool, cotton, or silk in the natural state, and when made into goods. For removing a heavy, fatty, suety yolk from wool, it is a pronounced success.

Good average greasy wool can be properly scoured in soft water at a temperature of 100° F. to 110° F., with 1lb. of potash soap, or $\frac{1}{2}$ lb. of ammoniac soap to a bale of wool weighing $3\frac{1}{2}$ cwt. to 4cwt. If the liquor and yolk can be saved by being returned into the soak bowl and the heat kept up, as many as 10 bales can be put through without changing. Soak quarter of an hour. A heavy pasty wool requires more heat and more soap; temperature not less than 130° F., with $1\frac{1}{2}$ lb. of strong neutral soap. In this wool the scouring temperature should not be allowed to diminish, and, if possible, the rinsing water, or water in the second bowl should be warm. In this class of wool, even with rather severe treatment, the yolk is not all removed, when, if the water is cold in the second tank, the sudden change will prevent the wool from becoming clean. In this instance the wool has a fatty, clammy or gluey touch. Soak half an hour.

EARTHY WOOL.—Temperature 110° F. Soak quarter of an hour, soaking 1lb. of soap.

RED SANDY WOOL requires a hot bath up to 130° F., with $1\frac{1}{2}$ lb. of soap per bale, and the soak to be changed every bale. The red dust destroys the cleansing power of the soap, and if the soak-tanks are not cleaned out every time a bale has passed through, the wool has a hard, gritty feel, with a reddish appearance. Lambs' wool should be treated mildly, temperature from 90° to 100° F., neutral soap, $\frac{1}{2}$ lb. per bale, and soaked from 10 to 15 minutes; red lambs' wool, 120° F., $1\frac{1}{2}$ lb. of soap, soaking fully 20 minutes.

RAMS' WOOL.—This is the most difficult of all wools to scour, and requires special treatment. Generally the yolk is of a more gluey nature than that found in any other kind of wool, besides containing a larger proportion of sulphur. This

adheres to the wool so persistently, that a rigid or severe treatment has to be adopted to get rid of the yolk, always leaving a shady or inferior colour. Even when scoured carefully the wool has a clammy feel. It is most necessary when scouring rams' wool to use an extra strong liquor, as much again as is required in an average wool, to which should be added about 4oz. of caustic soda. The temperature of the water should be never less than 130° , and often more, and the wool allowed to remain in the soak not less than 30 minutes. The rinsing waters should not be cold; the first should be hot, each after gradually reduced in temperature. When rams' wool is taken out of the hot soak, and put direct into cold water, which is generally done, the sulphur and heavy sticky yolk is fastened in by the extreme and sudden change, thus leaving a most undesirable appearance and sappy feel.

DRYING SCoured WOOL.—There are different methods of drying wool, more especially in the thickly-populated countries, when space is a great consideration. This may also be coupled with the greater uncertainty of climate in the great manufacturing centres of Europe and America. In many of the large factories, more especially those used by commission wool-combers, where there are sometimes as many as 30 scouring machines employed, each of which will turn out 20 to 25 bales of wool in a day, the drying must be done systematically and expeditiously, without any sudden changes in the temperature. To meet these demands, many automatic wool-drying machines have been invented, and are universally used to expedite the work. The first dryer used was the screen wool-dryer, but this is no longer used, because the wool required too much handling, making the operation expensive. The automatic, continuous wool-dryer is chiefly in use, when the wool, after being scoured, is passed through different hot-air compartments, each differing in temperature, to hasten the drying. When the wool has passed through the dryer, it is impregnated with hot air, and to do the wool

full justice it should be taken out on to the green for about an hour and spread out thick in the open air ; by this treatment it would lose its unnatural heat and have a more lively appearance. When the hot-air dryer is not used, the wool needs to be spread out on the green or drying flat, on sheets, for about three hours, according to the state of the weather. The wool will require to be turned, so that all parts receive uniform treatment. It is not necessary for wool to be dried thoroughly, and can be gathered a little damp to advantage.

Wool is a great regulator ; if thrown into a large stack from the drying ground and allowed to remain not less than 24 hours, more if possible, any sappy lumps, or dog heads, as they are called, will dry out, the drier wool absorbing the moisture. There is a great advantage in allowing scoured wool to remain in a large stack, for, as the unnatural heat escapes, nature in the shape of yolk returns, gradually imparting a kind, soft touch, together with a healthy, natural smell, which is a great consideration in scoured wool. After 24 hours in the stack, the wool is ready to press and fit for any market. Usually wool is pressed straight from the driers or drying green, which, in the interests of the trade, is not desirable.

In connection with the wool trade generally, whether on a station or elsewhere, there is a great tendency to wastefulness, but nowhere more so than in many of the scouring works. In England and America, for over 50 years, through keen competition, they have been forced to utilise all bye products in all trades, and especially those connected with woollen factories, where the saving of yolk receives special attention. Instead of allowing this valuable fat to run down the drain, it is made into a useful commercial commodity called lanoline, which is highly valued for its chemical properties. It is used in the high-class grades of toilet soaps ; it is also suitable for forming the base of one of the wool-scouring soaps—potash soap.

In our own wool-scouring industry, the idea of saving yolk seems to be neglected ; tons from single establishments are allowed to run to waste, the only idea being to get rid of it, and in the quickest possible time. When we consider that the average shrinkage in scouring throughout the whole of Australia is 50 per cent., its total loss appears to indicate a lack of enterprise somewhere. If a great outlay were necessary in its conservation, there would be some excuse for letting it run to waste ; but the outlay is small, especially when machinery is used for scouring. If a few long canvas troughs, or filtering beds, were placed under the level of the tank, so that the water from the soak only would run into them, the water would drain off, leaving the yolk floating, or, by changing the conducting troughs from one filtering bed to the other, yolk of the tank can be thus saved. About half of the 50 per cent. of shrinkage consists of sand, the other half being yolk ; so that from every 100lbs. of wool, about 25lbs. of yolk may be obtained.

WOOL SCOURING WITH ARTESIAN BORE WATER.—The use of artesian water for wool-scouring has, during the last few years replaced the ordinary river or creek water in the back country to a great extent, and a decided improvement is noticeable in the work done. Bore water is undoubtedly of even quality in any particular bore, therefore, the wool during scouring is not subjected to any change caused by flood, or water becoming stagnated. It is not necessary here to recapitulate what has been mentioned in ordinary methods in large scouring works, as the bore water can be used in exactly the same way to a greater advantage, and, if skilfully handled, no better water exists for the purpose.

The temperature of a great many supplies is admirably adapted for scouring the medium qualities of merino wool, without further expense being required for the heating of the water. Should the water be too hot upon leaving the bore, it can quickly and easily be reduced by exposure to the air until

a correct temperature is obtained for the rinsing process. The wool should pass rapidly through the water, and, to get the best results, should be immediately put through a steam-driven hydro-extractor after rinsing, which takes 70 per cent. to 80 per cent. of the water away from the wool, and no unevenness of colour results through the wool being allowed to drain. A cheap and useful plan of arranging a scour with ordinary boxes or crates is by excavating a trench about 6ft. deep, and fixing the boxes so that a copious flow of water passes distinctly through the box, sufficient space being left underneath to allow sand or sediment to escape.

Hand-washing is preferable to pot-sticking, the wool not being so liable to become roped. To carry out hand-washing, a cask, large enough for a man to stand in comfortably, can be sunk alongside the box to within about 6 inches of the water level; the washer can then handle the wool comfortably, will be perfectly dry, and can prevent the slightest approach to roping.

Wools turned out by a plant of this description can be compared most favourably with any scouring done by the latest improved modern machinery, a splendid colour being obtained, a sufficiency of nature or condition being left in to impart to the wool a nice, kind, delicate handle.

CLEANSING WOOL.

Heretofore manufacturers have contented themselves with simply securing the fibre cleansed from all impurities, without any thought being given to the valuable properties that are contained in the yolk. Though this latter has long been recognised as being of great importance for commercial and pharmaceutical purposes, its several parts have not been utilised to any great extent, because the methods for its collection and separation involved too great an expense, though efforts have been made to bring this on to a profitable basis for the last forty years, at least during that time

mechanical devices have been invented for cleansing wool with volatile liquids of the hydro-carbon class. There are important desiderata to be considered in freeing wool from its impurities. The scouring process should be as mild as it is possible to make it for the efficient removal of the grease. In order to do this there are only two known methods—the emulsion and the solvent. The former has usually been employed in connection with an alkali, such as soda ash, the fatty matter in the wool forming an emulsion with an alkaline solution. This process has been in long use, and is familiar to every manufacturer, the only advantage of which is its cheapness and safety from fire. Its disadvantages are numerous and have been frequently pointed out to those using it as liable to cause great injury to the fibre by seriously impairing its physical structure. So subtle, however, has been the destructive action of the alkali upon the fibre that it has remained unobserved, except when subjected to examination under a microscope. The detrimental effect of the alkali is double if used at a high temperature, which is very apt to be the case when the operation of scouring is placed in the hands of ignorant persons, as is usually done. Caustic alkalies, such as are used for scouring wool, cannot be used effectively, except in a solution at a high temperature, and then the action can readily become so intense as to completely dissolve the wool. Not unfrequently this is carried to such a degree that partial dissolution does take place. The temperature of the alkaline soap bath used in scouring wool should never exceed 110deg. of heat, if all the valuable properties of the fibre, especially the lustre, are to be preserved. Now, it is known to be a fact that the temperature is more often than not used in excess of this.

The essential qualities of the wool fibre to the manufacturer are its softness, strength, lustre, and elasticity. All these are really detrimentally affected to a greater or less extent by the use of caustic potash or soda, or any alkaline solution, though the injury may not be perceptible. On the

other hand, they are not affected, but preserved by the hydro-carbon, or volatile liquid process, which also leaves the fibre unimpaired as to its felting properties, simply because its physical structure is not changed. The difficulty, heretofore experienced, in the practical working of any plan for the utilisation of hydro-carbons for cleaning wool, has been because of mechanical inefficiency of method. It is a well-known fact, however, that wool cleansed by hydro-carbons, works with considerably less waste, and can be spun into finer counts than when cleansed with soap and water. Quite a number of inventions have appeared in recent years for overcoming the difficulties attending the use of volatile liquids for cleansing wool, but none of them have proved successful to our knowledge, unless it be the one to which we shall specially refer, as the invention of John T. Morse. Even in the late publication of Knecht, Rawson, and Lowenthal, reference is made to the numerous attempts towards the cleansing of wool by a volatile solvent. These, although theoretically giving good results, not only with regard to the washing, but also to the complete recovery of the by-products, have been found to answer well only on a small scale. "On a larger scale, practical difficulties have always shown themselves, in consequence of which none of the methods has hitherto been able to hold its own against the old process of washing with soap." From our personal investigation of the Morse process, we have no hesitation in saying that the main difficulties in the use of volatile solvents have been overcome to a sufficient extent to make it commercially successful for the cleansing of wool, and for the separation of the by-products for economical utilisation. The great drawback in the use of the solvent process, heretofore, has been the danger from fire or explosion. This danger has been removed, and the process is the cheapest and the best that can possibly be devised, so far as chemistry has enabled us to see.

In the Morse process, if properly carried out, this danger has been, we are satisfied, wholly eliminated. We desire to impress upon our readers that by the use of the hydro-carbon, or solvent process, no deleterious effect on the fibre need be feared. The fibre cannot, by any conceivable means, become impaired through any carelessness on the part of the ignorant workmen, and the manufacturer, therefore, has his wool given to him in a condition as perfect as the nature of the fibre will permit. With these conditions, it is readily seen that a fabric can be produced that is susceptible of a finish with all the natural characteristics of the wool preserved. The manufacturer will obtain, by using wool that is thus cleaned, less waste, greater fineness and strength of yarn, no loss in the natural lustre of the fibre, greater purity of colours, greater suppleness, or, in other words, a more perfect production. All the advantages above referred to in the use of hydro-carbons for cleaning wool we believe are secured in the process for treating wool which we have been privileged to carefully examine in practical operation, as carried out by the Morse Wool Treating Company, of Norton (Mass.). By this process wool can be treated in the open state, or in the original package, as may be most desired. So thoroughly and cheaply is this done for manufacturers, that it is a question whether the latter can find it to their advantage to cleanse their wool themselves. By the Morse process, the wool is conducted into what is termed a treating cylinder, into which is introduced a refined hydro-carbon solvent, filling the cylinder, after a vacuum has been created, thoroughly penetrating the mass of wool, and extracting all its wool grease. The removal of the air from the cylinder eliminates all possible danger of fire or explosion. The vacuum also enables the solvent to perform its functions more effectively. While in the cylinder, the solvent is subjected to a cold expansion process of great efficiency, for the purpose of permeating every part of the wool mass, no matter how compact it may be, whether baled in the original package

or otherwise. After the solvent has performed its functions, it is drawn from the cylinder, carrying with it the wool grease to separating stills, where it is vapourised and afterwards condensed, and delivered back to its original starting point. All foreign matter, including wool grease, obtained from the wool, is collected and separated, and the grease barrelled for shipment, to be afterwards manipulated for pharmaceutical and other purposes. After the wool has been treated with the solvent, it is removed from the cylinder and passed through a deodorising process, where it is subjected to a treatment of steam combined with air, blown through it sufficiently to break the steam. This leaves the wool in a remarkably sweet condition, and in this shape it can be shipped to the manufacturer who sent it, to be afterwards washed ; or the Morse Wool Treating Company will perform all this operation, if desired. If the wool, however, has been treated in the original package, and it is expected to be returned in that form, the deodorising process will have to be done at the mill where the wool is used. This process can be effected with inexpensive machinery, that hardly need be taken into consideration, so far as its cost is concerned, by the manufacturer.—*Textile Recorder*.

TECHNICAL TERMS USED IN FELLMONGERY.

FELLMONGER.—One who deals in skins.

WOOL-PULLER.—A man who takes the wool off the sheep skins, after they have been sweated or limed.

STATION SKINS.—Are the skins taken off sheep on stations, and afterwards dried, in which state they are sent to the market.

GREEN SKINS.—The skins of sheep which have been recently slaughtered, or fresh skins.

PELT.—A name given to the skin after the wool has been pulled, or taken off.

PELT WOOL.—The name given to wool taken off the skin covered with about two months' growth. A very short skin wool.

SLIPE.—The name given to pulled wool which has been dried and not scoured.

SKIN WOOL.—A term used to imply that the pulled wool has been scoured, to distinguish it from slipe, or unscoured skin wool.

PLUCKED WOOL.—Wool plucked from a sheep which has been dead a few days.

FALLEN, OR DEAD WOOL.—The wool taken off the remains of a sheep which has been dead a considerable time.

PIE PIECES.—Are the trimmings or loose ends cut or clipped off by the puller. Remnants of skins.

PIE WOOL.—The wool picked off the pie pieces.

FELLMONGERING.—This is a separate branch of the wool industry, and relates entirely to the handling of sheep skins, the main object being to divest the skins of their wool, leaving the pelt uninjured and the wool in its natural state. There are various methods by which this work is performed, none of which is completely satisfactory. The old system of the lime treatment left the pelt a rather difficult article to deal with in order to get out of it its real value. The lime had too hardening an effect, taking out much of the pliability and softness. Likewise with the wool, the lime treatment impregnated it with that mineral, destroying to a very great extent the valuable wool properties, rendering it unfit for use in the making of even a second-rate class of fabrics. The lime acts severely upon the delicate structure of the fibre, so that when passing through the different delicate machines, being devoid of pliability, it is easily broken, and continually wasting away. Fellmongering, as generally conducted at the present date, is a decided improvement upon the lime system, as, with a little carefulness, the pelt can be well preserved, as well as the wool, and both made suitable to the

requirements of the trade, as well as the cloth manufacturers. There are two kinds of skin continually coming into the market. Those from the station, having been dried and kept for some time ; and others, the green, coming straight from the butcher. These two classes of skin require different treatment. The latter, being soft, fresh, or green, are more speedily manipulated ; whilst the former must undergo a softening process. Therefore, the two classes cannot be worked together. Careful fellmongering firms will have the skins classed, according to length and quality, long, short, and crossbreds. Sometimes there is a minute classification. Full wools, $\frac{3}{4}$, 9 months' growth ; $\frac{1}{2}$, 6 months ; and $\frac{1}{4}$, 3 months' growth, besides pelts or newly-shorn skins. The station skins are thrown into the soak from 36 to 48 hours, so as to soften the pelt thoroughly. When bore water is available, skin will soften in about 12 hours and be ready for the sweating-room. Skins require to drain after being taken out of the soak pits for about four hours, after which they are hung apart in the sweating-house. This sweat-house is generally built of brick, about 6ft. high, with a few openings, and these have shutters, so as to regulate the heat. On the inside of the roof are long timber fixtures, with tenter hooks driven in about 6 inches apart. Each skin is taken separately by the back part of the neck, just behind the poll, and hung on to a hook until all the lots are softened. The skin on the upper part and centre of the neck is much thicker than on any other part, making a stronger and more secure hold for bearing the weight of a wet, woolly skin. The sweat-house is then closed, and gradually a moist heat arises, eventually forming a strong, steamy atmosphere, which softens the pelt and loosens the wool ; at this juncture rests the success or failure of the work. If a pelt is sweated too much it becomes more of a glutinous mass, and will actually run the same as warm glue or gum, rendering it useless for the tanner, and the wool is also greatly damaged.

In fact, the pelt and the wool can scarcely be separated. However, when there is a full sweat-house of skins those in charge are constantly on the *qui vive*, and before the wool begins to loosen the skins are taken down to the pullers, who take off the wool as described in station fellmongering.

NEW PROCESS OF WOOL-PULLING.

Some two years ago there was an article in the *Bradford Observer*, the great wool authority, stating that a new process of wool-pulling, or taking the wool from the sheepskins, had been invented by Mrs. S. L. Johnson. The process was so practical, easy, and expeditious, that the venture was taken up by a Yorkshire syndicate. As further showing its merits, most of the large fellmongers, tanners, together with that important body, the wool-combers, all being convinced of its genuineness, heartily gave their support as an acknowledgment of the importance of the invention. The invention consists of an electric knife, with which the wool can be cut off the skin in one piece, and can be afterwards rolled into a fleece. Under this electrical operation neither the wool nor the pelt is injured, but both are fit to be placed on any market. The knife is shaped something after the style of the machine shears or clippers, with the usual flexible cable, through which the electric current is conducted. Connected to this is a small shovel-like head, composed of a thin sheet of metal amalgam, which, under the electric influence, develops into a bright red heat. The operation of removing the wool is simply to push the knife close along the surface of the pelt, when the wool is rolled off, fast or slow, according to the ability of the puller. The actual operation in taking off the wool is so rapid that there is no trace of injury to either the pelt or the wool.

Whilst doing the work so effectually, the difference between the cost of the present pulling method and this new invention is greatly in favour of the latter, so much so that it is quite evident that there will be a revolution in the

fellmongering yards. It is claimed that a boy or a girl, with half a day's practice, will be able to strip the wool off more than eight dozen skins in the eight hours. As regards the wool alone, there is no danger of its being injured, as there is in the sweating and liming processes, under which it frequently happens that it loses its colour. The pelts are also in a much sounder state through not having been subjected to the sweat-house or the rough use of the fleshing knife. The use of this invention is essentially to the advantage of these colonies, where great quantities of skins are put through weekly, and would be the means of raising our reputation for leather production, which is not at a high standard at present.

FELLMONGERING ON STATIONS.

This work on stations is frequently carried on under most difficult circumstances, and it is surprising to see how creditably it is performed in most cases. Even if there is not a good soaking place, or a sweating-house, there is much real good work done when there are good sheepskins to handle. Prior to soaking the skins, they should be classed into long and short, so as to get a regular sweat, and care should be taken to have the feet, and even the face, skin and ears cut off, as these contract heat much sooner than any other parts, being composed of small sinews and bones, &c. When these objectionable parts are allowed to remain on the skin when put in the sweating heap, if there is any mis-timing, they will become black, and any part of the skin coming in contact with them becomes black also, thus causing the wool to have a bad colour, also even damaging the texture, making the whole of little value. After the classification of the skins, they are put into soak, but as the rivers are not available under the new regulations, a shallow water-hole, or billy-bong is the most convenient. The skins are thrown in promiscuously, but it is necessary to have the flesh or pelt side down, when they gradually sink, so that every particle

of the skin is thoroughly soaked. After the skins have been in the water for a day or two, according as they feel hard or soft, they can be taken out and put to drain for about twelve hours. A clean, tidy fellmonger will have, by the time the skins are drained, a space cleared of all grass and rubbish, on which to place the skins for sweating, *i.e.*, if there is not a sweating-shed or room. The skins may now be placed on the ground, which is properly done by taking hold of each separately by the centre of the back, so that the skirts and points, being the most difficult to sweat, will come undermost, where they attract the heat sooner than the outside parts. By placing, say, a hundred skins side by side, a most convenient stack will be made. More skins can be put on this bottom layer, so as to form a heap. This should now be covered up very carefully with any old bags or sheets, so as to prevent any cold air from penetrating into the heap, and at the same time keeping in the hot air. If the weather is at all cold they should not be disturbed for fully two nights and a day, probably a little longer, when their positions require reversing. In muggy and warm seasons, the skins should be turned or reversed after sweating from 16 to 20 hours, according to circumstances. A clean place is now required, all herbage removed, and well swept, and afterwards covered with anything handy—boards, old boxes, or old sheeting, on which to throw the wool, and to keep it clean when pulled or stripped off the skins. Anything in the shape of an old board, better still, a log, will suffice for a pulling beam, when placed in a sloping position on the edge of the cleared space.

The sweated skins from the stack can now be tried to see if the wool will leave readily, at the same time great care should be exercised, so as not to allow any cold air to get in, as they are much more difficult to pull if they become cold. The skin is now placed upon the beam lengthwise, with the head or neck at the raised end nearest the operator, who, with his hands, or more generally with a two-handled knife, the

wool is pushed, or pulled, to use the trade phrase, from the back first, then sides and shoulders, always keeping away from the edges. All the wool thus removed is put into a separate sort, and called "first" combing, if treating the longer-woolled skins. If the short wools are under operation, they will also be called "first," with the distinguishing brand of clothing. The edges of the skin are now brought into convenient position on the beam, when the largest patches of wool are removed and put into another sort called "seconds." Following on the short, bitty, inferior trimmings are made into "thirds," which can be further improved by keeping out the stained.

When a good many skins are in hand great care should be exercised, so as not to let the pulled wool remain in heaps, as the wool, being wet, will soon heat. If the wool is not to be scoured directly, it must be spread out to dry thoroughly, after which it may remain in heaps, or can be pressed at convenience. When the skins are in quantity, it is safest to pull all before scouring.

SHEEPSKINS.

Sheepskins upon most stations, selections, and farms receive very bad treatment, not the least attention being paid when skinning the sheep, while, after they are taken off, little or no notice is taken as to the best mode for their preservation. Like many other products, skins, if not cared for, will perish and become valueless; on the contrary, if proper attention is given them they will become a good source of revenue. The accumulation of skins is, in most instances, very slow, and they have to be stowed away until opportunities present themselves, either to fellmonger them or send them whole to the sales.

In my travels throughout different colonies I find that, as a rule, there is a tendency to ignore this small branch of the staple trade, and to those who do not know how to go

about this part of their business, it is hoped that the following notes will be of use :—

PREPARING SHEEPSKINS FOR MARKET.—The killing of ration sheep is looked upon as a piece of drudgery in connection with station work, and, consequently, there is very little interest taken in it. As a rule it is thought not to matter how the work is done, well or indifferently, so long as the sheep is killed. If we compare the time it takes to remove the skin badly, it will be found that it takes much longer than if it were done well. First, a careful method should be adopted.

The work of successful slaughtering and fellmongery depends entirely on the first stages of killing, because, if the skins are not opened out correctly on the legs and under parts of the sheep, it is not possible to take them off properly without using the knife, or without having large junks of fat and flesh attached to the pelt. By carefully noting the proper seam, *i.e.*, between the outer skin of the flesh and the pelt, the work is made easy by opening with the knife, thus easing the pelt a little all along the belly, legs, and neck, after which the hand will move speedily, and more effectually remove the skin than the knife. By this practice the sheep is properly skinned, the carcass is intact and presentable, whilst, if there is any neglect shown in the initiatory process, it will leave the body unsightly by leaving pieces of flesh and fat pulled and torn off. The skin presents an unsightly appearance, and the lumps of fat and flesh being very prominent, will certainly not assist in its preservation or enhance its value. It will be found that the hand does the greater part of the work, both more certainly and faster than the knife, the latter only being required about the legs, belly, and neck. If the sheep is not skinned properly, it makes the carcass an unsightly object, reduces its value, and also prevents the skin from giving the best results with regard to wool and pelt. Many station slaughtermen are very much surprised when they find that the skin does not come or run off easily, but if

they would take their time and use a little care at the starting point, they would soon find out where the mistake originated. A man begins skinning a sheep at the knee of the fore leg down the throat, and at these particular parts the real trouble commences. The hind leg also gives just as much trouble if pains are not taken. At these parts the outward part of the flesh is covered with a little fat, and being of the same colour as the pelt, it often occurs, that much of this fat adheres to the skin, and as it is pulled by the operator, he gradually gets under this fatty part, and cannot readily get into the proper seam. At this stage the operator generally loses his temper, pulls and jerks, and the skin is decorated with pieces of fat and flesh, is torn, and is altogether a much-damaged article. Cutting the pelt also often happens through want of care, and ought to be avoided as much as possible, as every cut means a few pence off the value; the damage so done makes the skin unfit for use for the best purposes. After the skin is off, it should be laid out straight, without any stretching, just to its natural shape. This should be done upon a board and not upon the ground, and under cover from the sun.

After it is set, which only takes two or three hours, it should be painted with a mixture of the following description:—1lb. of common soda and $2\frac{1}{2}$ lbs. of arsenic to $3\frac{1}{2}$ gallons of water; boil gently for 4 hours, stirring frequently, and be certain the arsenic is properly and thoroughly dissolved. When using the liquid take one pint and add three pints of water, which will be sufficient for 350 skins. The skins may now be painted, and great care should be taken not to miss the edges, and especially the neck. They are now ready for hanging, so as to thoroughly dry both pelt and wool. This may be done by fixing three saplings, ropes, or wires, one on top and one on each side a little lower, so as to make the latter to act as spreaders. By fixing the three ropes or wires in this triangular shape, and placing the skins thereon, the wind gets to the under part as well as the upper, and the painted skin should be hung lengthwise on the

wires from the neck to the tail, with the woolly side below. If hung across, the back being much longer and heavier, there is a great tendency to stretch and damage the skin where it rests on the top wire. When they are well dried, examine thoroughly to see if any part has been missed in painting, as the smallest bit not touched with the liquid will commence to breed weevils, which are destroyers of skins, and if not kept down will render the skin worthless. After a few days' hanging the skins may be placed or stacked in the shed. If kept dry they will keep for twelve months, if required.

If these precautions are taken, they will be eagerly bought at the highest prices, and any extra trouble spent on them will be amply repaid.

On the other side, we will just look at the case of a skin which has been roughly handled when taken off; and this is too frequently seen upon stations. In the first place, it realises only half its value, and, in the next place, if kept on the station, it is thrown about anywhere, no attention being paid to it, and gradually becomes an object more suitable for a rubbish heap than the sale-room. After all this carelessness, the manager sometimes asks, with wonder: "How is it that the skins or skin wool realise such poor prices?" The skins only require proper treatment, like everything else; then there will be no blaming the brokers for not getting prices, or the fellmonger for not getting a better colour in the wool when scoured. To give an idea of the value of a skin, a look at its structure is instructive, and should convince all that it is worthy of consideration.

There are three parts which form the skin—the external part, called the cuticle, which is thin, tough, and devoid of any feeling, and pierced with innumerable pores, through which pass the fibres of the wool. It has a scaly texture, and when dry and brushed like a piece of cloth, much dry dust flies off. These are scales, and the whole of the upper part or surface of the skin is composed of these. Below this there is a soft structure, called rete mucosum, which is with great difficulty separated from the skin beneath.

It is in this part where all the nerves of the skin and blood-vessels are situated. The colour of the skin and wool depends upon this section, as they are of the same colour as this substance. Beneath is the lowest layer, and is called "cutis," or main skin. It is composed of innumerable minute fibres crossing in all directions; they are very elastic, so as to yield to the motions of the body. These three parts together form the whole skin, and are composed almost entirely of gelatine, and can be dissolved by boiling or sweating. The uses of the good pelts are worthy of note, and it is interesting to know what useful and durable goods they are converted into. The most valuable use is for making parchment, noted for its durable nature. They are also used for bookbinding, making gloves, and other fancy, light and tough goods.

Machinery has done much to enhance the value of the pelts, by aid of which sound pelts can be split or cut into three parts. However difficult the splitting process appears, it is done both expeditiously and accurately. The pelt is fixed securely upon a frame, two knives are now adjusted evenly, so that each makes a parting, then they are set in motion, and the pelt is so evenly divided that the different portions appear to have been the covering of three sheep instead of one.

These particulars will at once convince many that by carefully preserving and protecting their sheepskins, they not only benefit themselves, but mankind generally.

We will now look at neglected skins, which, in the first instance, cannot possibly be used for the purposes above mentioned. The pelt, when cut, is almost useless, and fit only for making into glue pieces, worth from £2 10. to £3 per ton, so that, even in most convenient places, they will not more than pay wages for handling. The wool from these damaged skins is mostly of an inferior kind, from having to be pried down, a process which destroys the character and colour of the wool. Instead of being worth 18d. to 24d.

per lb., it is only worth from 5d. to 8d. per lb., and causes much more labour when in pieces than in the whole skin.

PACKING SKINS FOR MARKET.—Prices obtained for sheepskins depend a great deal on the growth of the wool, and the state in which they are placed before the buyers. However long the wool might be, if the pelt is not intact, sound, and well preserved, the value is greatly reduced. The skin trade does not now rest with local fellmongers as formerly, since a formidable competition now presents itself in the export trade, for which extreme prices are paid for any sound lots; and it is most necessary that the wants of this particular branch should be consulted. The same care should be taken of skins as if they were intended to be kept for station fellmongery at some distant date; the only additional work would be packing for the market, and systematic handling will give great assistance to the brokers in showing them to the best advantage.

It is necessary that all skins should be perfectly dried, or they will taint and become damaged; they should be classed into long and short, because there is a great risk of not getting full value when all are put into one lot, for the average has to be taken. The valuation is then made upon the shortest, the same as in valuing mixed wool, and the price is fixed according to the "low." Careful and clean packing is most essential, so that, when the broker weighs them in, his weights will compare favourably with the delivery note. This will give satisfaction, and will probably prevent unpleasant correspondence. Skins should be doubled, wool side out, feet cut off, and well protected with boards before they are wired or fastened, as the friction caused in carriage often causes weak places, doing much damage. These may appear only small matters, but if properly attended to they will assist greatly to meet the working expenses of the station; whereas if not looked to, this certain revenue will be lost.

MANUFACTURING.

FELTING PROPERTY.

FELTING property is the capability of some wools, through the agency of their elasticity, crimps and serrations, to interlock or entangle, forming a felted tissue or cloth. The felting property is found, more or less, in all wools; and several kinds of hair, such as llama, rabbit, cashmere, and mohair, and is not found in any other fibre, either silk or vegetable. As a general rule, that wool having the greatest number of crimps in a given space, together with flexibility, is best adapted for felting purposes, and on these qualities, and according to their high or low character, depends the felting property of the wool. The prime factors in the felting are the serrations or scales on the exterior of the fibre, and upon their formation and quantity rests the foundation of felting power. A high-class felting wool, one of the superior clothing type, is usually not more than two inches long, sometimes shorter, and possesses all the high wool characteristics thoroughly developed. The diameter of the fibre will be down to $\frac{1}{2000}$ of an inch; there will be over 30 crimps or curves to the inch, which will be truly placed throughout the whole length of the fibre. In a numerously-crimped wool are generally found the most serrations, and it is a common saying—more crimps, more serrations. (See page 142.)

SERRATIONS.

SERRATIONS—Are the scaly, notched or saw-like edges found on the wool fibre. These scales are of very minute formation, and can only be seen by the aid of a powerful microscope. Generally speaking, even among wool experts, the term serrations is used wrongly, and we, in a majority of cases, hear the exclamation, “How beautiful,” or “How well this wool is serrated,” when the wool in question shows a distinctly crimped formation. The difference is great; the crimps are easily distinguishable without the aid of a microscope, whilst the serrations are so minute that it is an impossibility to see them without. These serrations in a high-class wool have for two-thirds a free margin, whilst the one-third is attached to the fibre. The free margins vary much in different classes of wool, the coarser it is, the less the free margin, until they appear like a slight notch, when the felting property is almost nil. This wool is becoming closely allied to hair. The bases of serrations are attached to the main stem, whilst the free edges point towards the top. This can be easily ascertained by taking a staple by the tip and drawing it gently between the thumb and finger; there will be found a comparatively rough feeling, caused by coming in contact with the edges of the serrations. Take the staple *vice versa*, by the bottom, and draw it towards the tip, when there will be a smooth touch, and it will slip through easily, the result of drawing in the same direction in which the serrations are placed, and not against them.

It is a peculiarity in wool that the smaller the diameter of the fibres the more numerous are these serrations, and, with the aid of an ordinary microscope, you may count up to 3000 in an inch of fibre, and latterly, with the aid of greatly improved instruments, 6000 and over are found in one class of wool, whilst American authorities claim to have discovered up to 24,000 to the inch, each serration being found to have other minute points or horns, thus explaining the vastly increased number. In a pure Lincoln wool the average number of serrations is about 650 to the inch.

TEASING.

After the three initiatory processes of sorting, scouring, and drying, then commences the real manufacturing processes for transforming wool into fabrics. In the course of manipulation for the woollen and clothing process there is a wide difference when contrasted with the methods adopted for making the longer or combing wools into so many varied classes of textile cloths. After the wool is dried, it is in a more or less mixed, entangled, or knotted state, and it is necessary that it should be opened out or teased, which is done by the aid of a machine made specially for that purpose. This machine is called a "Willow" or "Teaser," which consists of a large drum, with three smaller ones mounted in a covered frame. The large drum is covered with rows of powerful, slightly bent steel teeth, and is made to rotate rapidly. The smaller drums or cylinders, called "Workers" are also provided with rows of steel teeth, which are placed over the larger drum, working in an opposite direction. By this action the workers clear all the wool off the larger drum, thus opening, loosening, or teasing it at the same time, when it is thrown into a large stack in a light, open, feathery state.

BURRING.

Some wools contain burrs and moits, which have to be taken out before it is passed on to the more delicate spinning frames. There are two processes of freeing wool from this objectionable vegetable matter, one by the burring machine, and the other by carbonizing, the former constructed much after the plan of the willowing machine. The burring machine consists of a large cylinder called a "Swift" (which rotates at a high velocity), which is covered with short spikes turned in the direction in which it rotates, and as the wool is passed on to the spiked drum, it undergoes a beating process, so as, to a great extent, to crush the burrs. As the machine receives the wool, the burrs, being heavier, hang out from the

spiked drum, and as it rotates it is met by three burring rollers in an opposite direction, when the hanging burrs come in contact with projecting rails, and are knocked out of the wool. The burrs with a little wool find their way on to a grating, when they are thrown off and pass through a similar process a second time.

Another method, viz., the carbonizing process, is often resorted to, to destroy all the vegetable matter. This process does not improve the texture of the wool, but leaves it a little unkind and harsh. The treatment is to steep the moiety wool in a weak bath of sulphuric acid for some time, when the chemical, together with the high heat, acts upon the vegetable matter; thus it is completely carbonized. Afterwards the wool is put through a bath of chloride of aluminium, so as to, as far as possible, restore it to its natural state, and counteract any damage done by the sulphuric acid.

OILING.

After the foregoing preliminary operations of manufacturing, which leaves the wool in a clean but dry state, it has to undergo an oiling process. This oiling is most necessary, as it would be very difficult for the hard dry wool to pass through the delicate drawing and spinning machinery without the assistance of oil. In the woollen manufacture, Gallipoli oil is used to the greatest advantage, and is more used in the woollen than in the worsted trade. The advantage of using oil is that it holds together the short fine fibres, thus assisting the drawing and spinning operations, and at the same time prevents loss of material.

BLENDING.

The next stage of manufacturing the raw material into cloths is blending. This blending is necessary, so as to obtain a uniform colour and quality to spin and weave into the numerous kinds of wearing material. Generally, the wool is

dyed into different colours, and by adding more or less of such colours as are necessary the exact shade can be obtained. Blending is done by placing in layers the required amount of dyed wool and spreading it out evenly. The same is repeated with wools of other colours, until all the different lots are in one large pile or stack. The operator then commences at one side or face of the stack, pulling out the wool evenly from bottom to top, giving it a good shake at the same time. This shaking partially mixed the wool when it is put into a teasing machine, and as it passes through, the blending is so thorough that the whole is of a very uniform appearance.

Blending is most frequently an operation for the special process of adulteration, and wool on many occasions is mixed with shoddy, mungo, or extract of wool, so as to make a cheap class of goods. Cotton, and even silk, are also very frequently used to blend with wool.

CARDING.

While disentangling the locks or staples of wool and the felted meshes of the filaments, which may be readily changed into a weavable thread, the amount of dislocation and blending which the fibres are subject to in their passage through an ordinary scribbler, is almost incredible, and it may be understood by considering the immense multitude of points which are incessantly operating on the wool. A machine, similar to that represented, contains 65,000,000 teeth. They have various functions to perform—50,000,000 are engaged in the material, disentangling, and conveying it from stage to stage, resisting in so doing the action of the teeth of adjacent cylinders, which may become charged with fibres. The remaining 15,000,000 are designated extractors or fingers. These last draw the wool from between

the carders of other rollers. In a scribbler, mounted in this manner, the material is continually separated and acted upon, being divided and re-mixed by the 15,000,000 points, and this is not all. A set of carding machines contains two or three engines, whilst rollers all covered with card clothing of increasing fineness, so that by the time the wool escapes from this process a complete disturbance of the natural order of the fibre has been effected, and they have, moreover, been adjusted with such mechanical precision as to be readily convertible into spun yarn.

CONDENSING.

When the carded wool leaves the carding machine in the form of a sliver or ribbon of wool, it is condensed or divided into smaller strips. Afterwards these smaller strips are condensed into rounded slivers, just sufficiently twisted and compact to enable them to be wound on to a large metal bobbin. The condenser consists of rings of card-cloth, the same width as the strips are to be made, and placed on the drums, when the rings, as they come in contact with the stripper, take off a part of the sliver. These narrow strips, as they are passed out by two oscillating rubbers, which form the condensed sliver into a rounded but loose untwisted wool, are really the first operation of spinning into yarn.

SPINNING.

There are several methods of spinning, the mule-frame being the most used for spinning woollen yarns. This frame consists of a stationary part on which are placed the bobbins of condensed sliver or strips; there is also a travelling carriage which works backwards and forwards from the

stationary part. On this carriage are placed rows of spindles, which twist the yarn, and at the same time winds it on smaller bobbins. The carriage at the commencement of the opening process is close up to the stationary frame, when the ends of the rounded or condensed sliver are passed through two smaller rollers called giving-off rollers, and are connected with the bobbins on the carriage. The carriage now commences to travel backward on its rails, the sliver being simultaneously delivered to it through the rollers until a certain length is given out; and as the carriage is moving the spindles revolve slowly, twisting the sliver; but up to this stage there has been no drawing out. The rollers now stop giving out sliver, the carriage still continuing to travel back, and the spindles, now revolving at a greater speed draw out the sliver fully 100 per cent., twisting it at the same time. The required twisting is finished when the carriage becomes stationary at the end of the rails; then the spindles are reversed several times to unwind a small portion of the yarn which the twisting movement leaves at the end of the bobbin. The carriage now runs back to the stationary frame, the spindles winding the finished yarn on to the bobbin.

WEAVING

Is the art of interlacing different yarns so as to form a cloth or fabric. To form this fabric it is necessary to have two kinds of yarn, the warp and weft. The warp is really the foundation of the cloth, and the yarns used for that purpose are mostly placed parallel the whole length required, forming what is called the web, the weft is the yarn or thread which is thrown crosswise from each side of the warp, so filling up the latter and forming a fabric. The threads constituting a warp are mounted on the weaving loom, the weft being thrown across in a shuttle by a picking stick. There is a

difference between weaving, on the one hand, and, on the other, knitting, netting, and looping, by which means clothes can also be made from different threads. Cloth may also be produced by felting, which does not require any spun yarns, but is simply a method of entangling or matting the raw material. Before the weaving process, the warp yarns have to be arranged on a large frame, called a warping frame, where all the threads intended to form the web are placed parallel. In the finest cloths the warp consists of many thousand threads. This operation is performed on a warping machine, consisting of a vertically-set reel on which the single thread from a row of bobbins is drawn on to a beam. The individual threads are simultaneously joined in a heck, which is made to slide up and down as the warping frame revolves, thus delivering to the reel the threads or yarns which form the web. In the heck there is a device by which every alternate thread is raised up whilst the other goes down, thus providing for the passage of the shuttle crosswire, leaving the weft yarn behind each time. According to the design of the cloth, so are these threads of yarn arranged in the heck. This warp on the beam is now handed to the beamer, who takes each end of the threads, which are placed side by side, the width of the cloth to be woven. The beamer having beamed the whole of the warp, it is sent on to the weaver, who places it in position at the back of the loom. Afterwards each thread is tied, or connected otherwise, through a reed (a long, comb-like article, made of thin, flat wire, placed top and bottom in two longlathes of wood), with another thread left from the last woven piece of cloth. When all the ends are connected, the whole warp or web is secured on to a beam in the front of the loom, on which the cloth is wound as it is woven. This reed is fixed on to a movable beam, working backward and forward, and this action causes the weft yarn left behind to be pushed up each time the shuttle crosses the warp, and in this manner a piece of cloth is woven.

CLOTH-FINISHING.

The web, or, in other words, a piece of cloth before it is taken out of the loom, is in a very rough, unfinished state, appearing slack, open, and showing all the traces of the threads. These, with the greasy condition, and the effects of the sizing, make the cloth dirty in appearance. All these have to be removed by the aid of hot, soapy water, in a trough, narrow at the bottom, and fitted with wooden hammers, which, with the aid of steam-power, are made to fall in a slanting direction on the cloth. After this process the cloth is taken out and stretched, and then dried, when it is handed to the burling process, an operation performed by women, who pick out all moits, or double threads, also darning any holes or open spots showing in the cloth.

FULLING.

Fulling is another name for felting, milling, or shrinking, and is a process confined to woollen manufacture, more especially to the highest class, as broadcloths, doeskins, and other cloths having a nap, or a smooth, soft, velvety surface. Such cloths are made from the highest class of serrated wools, which possess the real felting or fulling properties.

Fulling is performed in milling stocks, or in the more modern milling machines. The cloth in the rough, as it is taken out of the loom, is thoroughly soaked in hot water and soap, afterwards put into the stocks or machine, when heavy weights are arranged so as to be raised by power. These weights are then allowed to fall simultaneously on the piece of cloth, such falling or beating causing it to become regular and even in thickness; at the same time there is a gradual fulling or felting taking place, and when completed all traces of the yarn threads are obliterated. After the cloth is taken out of the fulling machines or stocks, it undergoes

another washing process, so as to perfectly free it from soap, which is done by passing the fulled fabric through a bath of warm to gradually cold, clean water. The cloth is now tentered, or stretched, by being fixed on large heavy frames, to keep out all creases whilst it is drying. This tentering is very often done in the open air, although most woollen factories are provided with a tentering-room well heated by steam. It is understood that when cloth is tentered in the open air it is always a much better colour than if treated in an enclosed room heated artificially.

TEASLING.

This is an operation to raise a nap or pile on the surface of the cloth after it has been milled. The raising of the nap is accomplished by the aid of the prickly or spiked head of a plant, called the teasle, which is chiefly grown in Belgium. The spikes are sharp-pointed, possessing pliability, but sufficiently stiff for the teasling work. The teasle-spiked heads are worked on the milled cloth, scratching its surface; by forcing their way they become entangled with the fibres, pulling out their ends straight, thus causing a fine but irregular nap. Formerly the teasle heads were arranged, when the operator brushed the tightly-stretched cloth all over. However, this laborious work is almost out of date, being superseded by what is called a dressing-machine. This machine consists of a cylinder densely covered with small steel spikes, and rotates at a high velocity. The cloth is stretched uniformly, and when the surface comes in contact with the cylinder the spikes raise the ends of the fibres, the same as in the hand-teasling, leaving the same uneven surface.

CROPPING.

When the cloth has passed through the ordeal of teasing there remains on the surface innumerable ends of fibres, giving a rough and almost ragged appearance. These ends, and anything rough on the surface of the cloth, have to be removed, so as to give a more finished appearance. The removal of these multitudes of ends is performed exactly in the same manner as a mowing-machine or a lawn-mower acts on a lawn of grass. The machine now used for this cropping purpose is a cylinder, on which are placed knives or cutters, slightly spiral. This cylinder so armed revolves very rapidly, and as it comes in contact with the evenly-stretched cloth, crops or cuts off all protruding ends, etc., leaving a smooth surface or pile.

PRESSING.

In order to give the cloth a more refined or finished appearance, when taken out of the cropping machine, it is brushed and freed from all loose fibres. The brushed piece of cloth is then wound tightly round a drum, which is now immersed in water heated up to 180°, and allowed to stay for about four hours. The cloth and drum are taken out and unwound, and re-wound end for end on another drum and again immersed in the hot bath. Lastly, the cloth is placed evenly in a hydraulic press, when heat is introduced, either by placing hot iron plates in each fold or by injecting steam through the press, the latter process having a tendency to solidify and impart smoothness, also to develop the brightness necessary in a well-finished cloth.

WOOL-COMBING.

There is no better-known term in connection with the wool trade than combing ; and as regards the actual process of wool-combing, very few pastoralists, or even many who

are engaged in the wool business, are acquainted with the process. The term "combing wool" is used to distinguish it from "clothing wool," and there is great distinction both in the actual manipulation of each class of wool, and in the appearances they have after being passed through the different machines necessary for manufacture of textile goods or fabrics. In the clothing process the wool is torn up into the smallest lengths for carding purposes; in fact it has been said that there is no wool too short if it only has two ends. On the other hand, what is required for the combing process is length and soundness, as the wool is combed out straight, so that the fibres are placed parallel. To Australians generally the following illustration will convey the real idea of the meaning of wool-combing. There are very few countries where horses are used so extensively, and play such an important part, in the natural pursuits, more especially the pastoral industry, as in these colonies. It is usual on sheep and cattle stations to use horses for all kinds of work, especially mustering, driving, and drafting, which, after a course of continual and hard work, must have a rest or spell for months. After this lengthy rest, the horses are run in from spell paddocks, fresh and lively, and naturally present a shaggy, rough appearance, more especially their tails and manes. One of the first duties before a horse is put into work again is to make him presentable by a little grooming and cleaning of its long, straggling, entangled tail and mane. This combing, or straightening out, of the tail and mane really illustrates the wool-combing process. It is necessary in the first place to have the matted, entangled tail opened out or prepared, just the same as wool is prepared prior to being put into the combing machine. In preparing the horse's tail previous to the actual use of the comb is frequently a very difficult matter, owing to the long, entangled, or cotty ringlets. Under these circumstances it is usual to make use of the strong blade of a pocket knife to ease or cut through the entangled mass, so as to make the combing process easier for

both comb and comber. Now commences the real combing process, and as the operator, with the aid of an ordinary stout comb, forces his way through the horse's prepared tail. Every time it gets easier, and each time combs out loose, dried short hairs and knots, until the comb is full, when it has to be freed of them. In this manner the horse's tail is made perfectly free, and all the hairs are cleansed, sound, and lie parallel, just the same as wool appears when it has passed through the combing machine, after which it receives the name of Top or Sliver. The short knots and hair combed out of the horse's tail in the ordinary way represent the Noils which are combed out of wool by the combing machine.

DRAWING.

Following the combing process is drawing. When the sliver from the combing-machine is delivered, it is rolled into a large ball, now called a top. This top is re-wound on to a large bobbin, when it undergoes the operation of drawing, or, in other words, the sliver has to be drawn out or extended, thus reducing the body or bulk and adding to the length. The drawing is done by connecting the sliver to two receiving rollers, which pass it to a set of delivery rollers, revolving more quickly than the receivers, so as to draw or make the sliver thinner. In this manner the sliver is drawn out several times, the fibres always lying straight and parallel, differing in this from the woollen thread or yarn. The last stage of drawing is called roving, differing only in giving the drawing a little twist.

SPINNING.

The bobbins containing the slightly-twisted roving are now ready for the spinning frame, which draws out, twists, and winds the thread on to an elongated bobbin.

This movement is performed exactly on the same principle as the drawing, only that the yarn is greatly reduced in bulk, presenting a very fine, smooth thread, sometimes so fine as to consist of only two or three fibres of the finest merino wool. The spinning frame contains a great number of spindles, all of which spin to the same count or quality at the same time. The bobbins containing the rovings are placed on steel pegs on the top or head of the spinning frame, with a slight forward incline, so that the thread is delivered readily. The roving is now passed on between a pair of rollers, and is carried on by a pair of carrier rollers to a pair of front rollers; the upper is covered with leather, whilst the lower are steel and grooved. The space between the back and front rollers is where the final drawing takes place, the fineness of the thread depending entirely upon the rate of speed at which the front rollers are travelling. Immediately the fine yarn has passed the front rollers the twisting takes place, which is done by the assistance of the spindle before the yarn is wound on to a spool or tube. It is now ready to be handed to the warper, if warp yarn, or to the weaver, if weft yarn.

DIFFERENT CLOTHS MADE FROM WOOLS.

Of the manufactured fabrics there are great numbers coming under the principal or chief heads of woollen, made from clothing wools; worsted, made from combed wools; hosiery, made from an intermediate grade, coming between a combing and a clothing, a wool of a soft, kind nature, open, with little felting qualities. Clothing, or woollen, embraces fabrics having a raised, fine nap or piled surface—viz., livery, broadcloth, billiard, doeskin, cassimere, melton, beaver, frieze, piano-hammer head, saddle-cloth, etc. Of cloths, cropped and fullered, Venetians, sataras, and

diagonals, the warp and weft being arranged differently. Of tweeds, a very large variety, which are partially felted, raised dry, cropped and pressed. There is an even greater variety in cloths made from worsted, or combed wools—viz., Mousselaines, delaines, cashmeres, merinos, made from merino wools; Orleans, delaines, camlets, tartans, poplins, and serges, made from demi-lustre wools; Russell cords, damasks, repps, sateens, lastings, linings, furniture cloths, etc., made from the lustre wools. Hosiery is an extensive branch of wool manufacture into light, open, unmilled, fabrics—viz., Knitting yarns, clouds, under-garments, flannels, from merino, fine English, and lambs' wools; Blankets, wrappers, shawls, curtain cloths, rugs, and carpets, from the coarser short wools.

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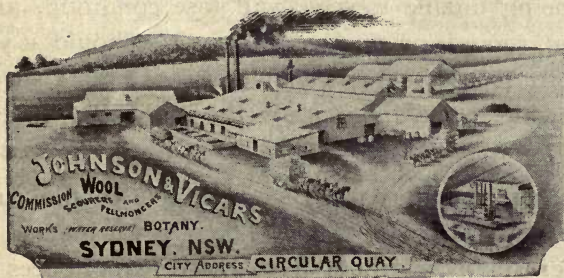
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FOOT ROT.

The question of foot rot is one that very materially affects all owners of or those interested in sheep. Many stations have hitherto never had this disease on them, but are liable at any time, through interchange of stock, to have the germs carried to them, for this disease, having once made its appearance among the flocks, is liable at any time to break out again; the germs of the disease may lie on the ground for months, or may be for years, only waiting a favourable opportunity—a wet season—to once more bring it into activity.

Sheep grazing on these localities, their feet will pick up the germ hitherto dormant, and become infected, usually in the wall of the hoof or in the cleft, which, if not attended to at once, will break out into running ulcers, the discharge from which, adhering to the ground and grass, and being of an infectious nature, will be picked up by healthy sheep, and thus rapidly spread through the entire flock.

Pastoralists, therefore, will do well to carefully look to their sheep, especially merinos, which are particularly subject, for any signs of foot rot, for should the disease once get a fair hold, it will soon cause havoc among the flocks. As the disease develops, the horn of the foot will grow long and twisted, causing the sheep all degrees of lameness, and the animal, from being unable to feed, will lose condition, and die of starvation, though on the best of grass. Should it yet live and be shorn, it will be found that the wool from a sheep with foot rot, owing to the difference in the texture, will have depreciated fully one penny per pound.

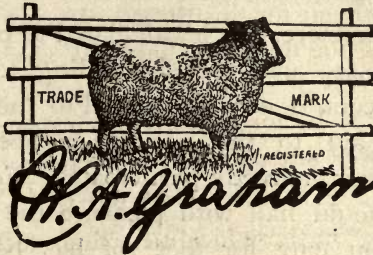
Any discovery, therefore, that is conducive to the cure and prevention of foot rot cannot fail to be of great interest to our sheep owners, many of whom have costly experiences of coping with this disease. The most they have achieved has been to afford temporary relief, and to check for a time the

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TESTIMONIALS.

N. S. WALES.

Dear Sir,—Please send us three tins of Foot-Rot Powder, Graham and Co.'s, same as you sent before. This is the *best remedy* I have ever used for Foot-Rot in sheep. It gives almost *instant relief*. In such a season as the present, it will be an act of kindness on your part to bring this remedy more prominently before your friends.

E. P. HUXLEY & Co.

VICTORIA.

This is to certify that Mr. Wm. Graham dressed about 90 sheep with his Foot-Rot Specific. These sheep were picked out by hand as being the worst affected that we had, some having been bad for over a year. After being dressed, they were turned out in a paddock with others nearly as bad as themselves, and have remained with them since. They were first dressed on October 31st, and have had three dressings since. They are now all cured, with the exception of three sheep, each having one foot still affected.

A. J. BLACK.

SOUTH AUSTRALIA.

I have much pleasure in testifying to the value of Graham's Foot-Rot Specific, which I have lately used with gratifying success on stud rams and other sheep at Buckland Park, the property of L. G. Browne, Esq. For twenty years we have used other specifics without avail on our wet country, but with Graham's Specific the sheep may be put back on wet pastures and still improve and heal up. I treated thirty rams which had been suffering in a chronic state of Foot-Rot for two years, and with one dressing of Graham's Mixture they were thoroughly sound in three weeks. I also treated several sheep recently badly scalded between the hoofs, and in three days they were able to walk about quite well and thoroughly dried up.

SIMON MATHESON, Manager

NEW ZEALAND.

From MESSRS. MALLOCK & LANCE, HORSLEY DOWNS STATION,
HORSLEY DOWNS, April 2nd, 1886.

This is to certify that Mr. William Graham has dressed some 3,000 sheep for Foot-Rot for us, and at date of writing they appear to be *sound* after careful inspection

E. GILES (for Mallock and Lance).

N.B.—Mr. Lance was M.P. and was the Government nominee to represent N.Z. at the Sheep Conference at Melbourne.

For all Particulars
apply

R. J. MACLEAN & CO., Agents and Importers,

375 KENT STREET, SYDNEY.

progress of the ailment by using old-time remedies, the effect of which was not permanent, and therefore very costly, especially when used on a large scale, by reason of the constant repetition in handling and attending to the sheep, and often loss of the animals themselves, owing to the increased suffering and wear and tear.

Anything, therefore, that is calculated to prevent this loss and great expense, and thereby adding to the gains of individual producers, is so much added to the wealth of the community, an aid to the natural prosperity in which everyone directly or indirectly participates. For these reasons sheep owners should hail with pleasure the announcement that a permanent cure for foot rot has been discovered, genuine and reliable, which testimony of its efficacy has been borne by many well-known sheep owners.

It is claimed also that after the comparatively trifling initial cost incurred in its application the cure is permanent, it having successfully withstood the severest tests which could be applied to it by many large sheep owners, who, unfortunately for them, have this disease continually among their flocks. The sheep, after being once dressed, may run on the very ground on which they became infected, for the specific will act as a preventative, securing sheep under treatment from picking up fresh germs, and guarding those cured from again contracting the disease.

The claim put forth by the discoverer is well founded, and, in face of the evidence as furnished by these well-known gentlemen, completely answers in the affirmative settlement of the vexed question, "Is foot rot curable?" and is, therefore, very welcome news indeed.

This remedy, therefore, should be a boon indeed to our pastoralists generally, and should be considered in the light of a public benefactor.

P. & O.

COMPANY'S ROYAL MAIL SERVICES TO EUROPE, EGYPT, INDIA, CHINA AND JAPAN.

P. & O.

DEPARTURES FROM SYDNEY, MELBOURNE AND ADELAIDE EVERY FORTNIGHT.

P. & O.

PASSAGE MONEY TO—


MARSEILLES, Single	.. .. .	£32 to £65*
LONDON	.. .. .	35 to 70*
INDIA	.. .. .	25 to 40
MARSEILLES, Return	.. .. .	60 to 100
LONDON	.. .. .	65 to 110
INDIA	.. .. .	41 to 60

*There are a limited number of Berths for which the charge is from £5 to £10 less.

P. & O.

E. TRELAWNY, SUPT. SYDNEY.
F. WHITE, AGENT MELBOURNE.
ELDER, SMITH & CO., LTD., AGENTS ADELAIDE.
CHAS. PARBURY & CO., AGENTS BRISBANE.

INTERIOR VIEW OF LARGEST SHED.



DAYING BELTS AND SCOURING MACHINES.

NEW WOOL SORTING.




LAKESIDE WOOL SCOURING COMPANY
PRIVATE PROPERTY

LAKESIDE WOOL SCOURING CO.

WRIGHT & ABBOTT
COMMISSION WOOL SCOURERS.
WOOL BROKERS &c.
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WORKS WATER RESERVE, BOTANY.

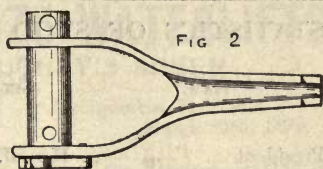
OFFICES: SYDNEY AND CITY.

Statistics of Stud and Flock Sheep.

Highest Prices Realised, 1890-1900.

The following is a list of the highest prices paid for Merino Stud Sheep at the Sydney Sales during the ten years from 1890 to 1900:—

RAM.	SELLER.	PRICE. GNS.	PURCHASER.
1890.			
Sacramento III. ...	W. H. Gibson ...	370	Cobb and Co.
Big Leg ...	„ ...	310	C. Fetherstonhaugh
Hero Prince ...	W. Gibson & Son ...	700	W. H. Watt
Ram ...	T. Gibson ...	500	F. E. Body
Matchless ..	T. McFarland ...	1000	P. McFarland
No. 9 by ditto ...	„ ...	460	Hon. W. Halliday
(Not named) ...	R. Gadegast ...	550	Jas. Lee
1891.			
Golden Tom ...	James Gibson ...	370	J. W. Eckford
Albert III. ...	W. Gibson and Son ...	710	Bathurst S.B. Assotn.
Wanderer ...	T. Gibson ...	450	L. E. Lowe
Ram ...	Collaroy Co. ...	500	E. Van Weenan
Albion ...	R. and P. McFarland ..	650	A. A. Co.
1892.			
Golden Horn II. ...	James Gibson ...	630	Hon. H. R. Roberts
American Ram ...	Hon. G. H. Cox ...	570	Collaroy Co.
Triumph ...	McFarland Bros. ...	500	R. Rouse, jnr.
Young Golden Horn ...	C. B. Grubb ...	500	James Lee
1893.			
Agitator ...	H. C. White ...	300	J. R. Gill
Chapman ..	R. D. and W. Clark ...	300	James Lee
Paragon ...	James Gibson ...	250	Henry Moses
Royal Hero ...	W. Gibson and Son ...	500	C. B. Grubb
Dense Royal Hero ...	„ ...	250	Dangar Bros.
1894.			
Gold Drop... ..	R. D. and W. Clark ...	500	J. C. Watson
(Not named) ...	„ ...	200	P. Jones
Albert VI. ...	W. Gibson and Son ...	170	Mackay Bros.
Eighth Albert ..	„ ...	255	E. Martin
(Not named) ...	Collaroy Co. ...	190	R. M. F. Eckford
1895.			
Paradox II. ...	Hon. J. Gibson ...	150	Tubbo Estate Co.
(Not named, sire Logan V.)	Collaroy Co. ...	260	J. Jones
Golden Fleece ...	Clark Bros. ...	155	Van Weenan



NORTON'S PATENT WIRE STRAINER.

The following are a few of the many advantages possessed by this Strainer over others:—

1. It will strain wires at a post without having to plug the holes (which many posts in an old fence will not stand).
2. It will splice wires between posts.
3. It will mend posts that have been split, by straining a piece of wire round them.
4. It is neat, simple, and portable, being only 7ins. in length and 2lbs. in weight. It can be easily carried in the pocket or on the saddle. As this Strainer is made of a special quality of steel, it is very strong and not liable to derangement, and although it will do all the work claimed for other Wire-Strainers—and more—it is both simple in construction and working, and cheap.

PRICE 10/6.

Sent Post Free in New South Wales on receipt of 11/6; other Colonies, 12/6.

Norton's Patent Wire Strainer Co.,

Office: 33 ROWE STREET, SYDNEY.

William Brooks and Co.

We Make a Speciality of . . . STATION PRINTING.
 We Supply all Descriptions of STATIONERY.
 We keep a Large Variety of . . . SPECIAL BOOKS and
PRINTED FORMS

For Station Proprietors.

17 Castlereagh Street, Sydney.

SEND TO US FOR
ANYTHING YOU REQUIRE.

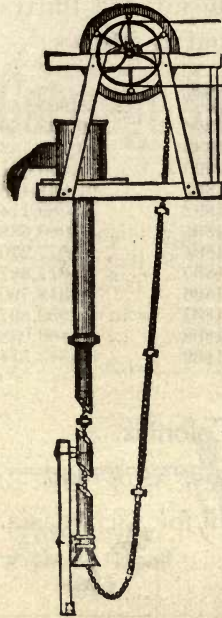
Telephone 810.

STATISTICS OF STUD AND FLOCK SHEEP—*Continued.*

RAM.	SELLER.	PRICE. GNS.	PURCHASER.
1896.			
President ...	Hon. J. Gibson ...	1600	Grubb and Lawrence
Ben Harrison III. ...	E. D. Morrison ...	700	Brooke Bros.
Pastoralist II. ...	J. B. Gibson ...	350	F. Keach
(Not named) ...	J. Taylor... ..	345	E. Martin
(Not named) ...	S. McCaughey ...	500	J. S. Horsfall
1897.			
Autoerat ...	S. McCaughey ...	300	R. Whitehead
Banker ...	„ ...	270	J. S. Horsfall
Royal Hero II. ...	W. Gibson and Son	250	J. M'Donald
Third Hero II. ...	„ ...	250	W. Leonard
Royalist ...	W. H. Gibson ...	1000	Moses Bros.
Waterloo ...	James Gibson ...	580	A. A. Dangar
Trafalgar ...	„ ...	350	S. White
Loyalty ...	Thomas Gibson ...	280	E. Martin
1898.			
Federation ...	H. C. White ...	400	Exors. R. F. Horsley
Macquarie ...	Hon. Jas. Gibson	510	Scottish Ans. Invt. Co.
Progress ...	Thos. Gibson ...	310	H. C. White
Son of Progress ...	„ ...	410	J. B. Bettington
Half-Sovereign ...	Hon. Jas. Gibson	200	G. C. Clark
Son of President ...	„ ...	270	E. Martin
1899.			
The Admiral ...	Thos. Gibson ...	1500	G. F. Simpson
Pioneer ...	John Taylor ...	900	McMaster Bros.
Young Royal Hero	C. B. Grubb ...	700	C. Leonard
Son of Primus ...	John Taylor ...	670	Fairbairn Pastoral Co.
Premier ...	Clark Bros. ...	500	Wm. Keogh
Captain ...	Hon. Jas. Gibson	420	C. Leonard
General ...	H. C. White ...	300	White Bros.
Reserve ...	Hon. Jas. Gibson	300	N. McCallum
1900.			
Loyalty II. ...	Thomas Gibson ...	600	Keach and Bennett
Royalty ...	Herbert Gatenby	505	E. Martin
Young Warrior ...	W. Gibson and Co.	325	Tubbo Estate Co.
Young Vice-President	Hon. F. W. Grubb	310	Ryder Bros.
Slender Sam ..	H. C. White ...	300	H. E. A. & V. White
Sterling ..	R. T. Gibson ...	300	McDonald Bros.
No. 3 Loyalty ...	Thomas Gibson ..	300	W. A. Gardiner
Ram, by Sterling...	R. T. Gibson ...	210	R. T. M. Eckford
Royal ...	E. W. Gibson ...	200	Dangar and McDonald
Sir John ...	W. H. Bennett ...	280	Geo. Bruce [Bros.
Commander-in-Chief	S. H. Grueber, jnr.	250	N. A. Gatenby

FLOOD'S PATENT PRIZE WATERLIFTS

And Mr. SAMUEL McCAUGHEY'S SHEEP.



Goolgumbla, Jerilderie.

March 29th, 1899.

MR. F. FLOOD, Sydney,

Dear Sir,—Your letter of the 24th inst., asking for some particulars of work done with the two Waterlifts purchased from you, received.

I may say that the results are excellent throughout. I have been working both Lifters all the summer, filling tanks in various parts of the run.

The 3½ inch Lift I found the most useful, especially where water had to be taken any considerable distance. In one instance the water travelled six miles and five chains in an open drain to tanks. Both Lifters have been kept going night and day, Sunday included, all the summer, and are still at work, and the cost of repairs has been infinitesimal. The Wells vary in depth from 100 feet to 140 feet. In practice I find the best speed for the 3½ inch to be 75 revolutions, and for the 2½ inch 90. I filled or partly filled, thirteen tanks, some of them very large, the distance from wells varying from half-a-mile up to over six miles.

I estimate the quantity of water lifted in the 24 hours by the 3½ inch to be 288,000 gallons, and for the 2½ inch 144,000 gallons; but by running them at a higher rate of speed, without the intermediate gear, better results could be obtained. As, however, it was imperative that the Lifters be kept going without any serious stoppage for repairs, I did not run any risks.

The depth of wells did not seem to make much difference in the quantity of water lifted, it being merely a matter of more or less steam.

The 3½ inch Lift is worked with a 12 h.p. engine, and the 2½ inch Lift with a 6 h.p.

I expect to stop work for this season in a fortnight's time.

Yours faithfully,

S. V. STEAD,

[Manager for SAMUEL McCAUGHEY, Esq.]

P.S.—I have made a careful estimate of the quantity of water lifted, making full allowance for shifting plant and for repairs, and I find that over 29,000,000 gallons of water was lifted by the 3½ inch and nearly 15,000,000 gallons by the 2½ inch. One large dam watering from paddocks got over 7,000,000 gallons. The stock were watering in the drains all the time the pumping was going on, the length of drains used being over twenty-one miles, and these were made with a drain plough made on the station. A 6 h.p. engine in good order would, I think, work the 3½ inch Lifter.

REVISED LIST OF PRICES FEBRUARY 1st, 1900.

Diameter of Cylinder.	Power required for Height Lift.	Quantity raised per Minute.	Price with frame for 12 feet.	For Every additional foot.	Extra
1½ in.	1 man 35 feet	14 gals.	£16	10s.	
2 "	1 man 20 "	24 "	£16	10s.	"
2½ "	1 man 10 "	50 "	£16	10s.	"
3 "	1 man 10 "	60 "	£20	12s. 6d	"
3½ "	2 men 10 "	100 "	£24	15s.	"
5 "	1 horse 10 "	300 "	£36	20s.	"
7 "	2 horses 10 "	600 "	£48	30s.	"
10 "	4 horses 10 "	1200 "	£81	60s.	"

Or 5 strong horses will raise 2000 Gallons per minute 8 feet.

Address: 60 Drutt Street, Sydney.

New South Wales Sheep Returns.

The number of sheep in the colony during the thirty-eight years ending 31st December, 1898, stand as follows :—

Year.	No.	Year.	No.	Year.	No.
1861	6,119,169	1874	22,797,416	1887	46,965,152
1862	6,558,896	1875	25,353,924	1888	46,503,469
1863	7,169,126	1876	25,269,755	1889	50,106,768
1864	9,082,463	1877	21,521,662	1890	55,986,431
1865	9,650,106	1878	25,479,484	1891	61,831,416
1866	11,644,593	1879	30,062,910	1892	58,080,114
1867	15,066,377	1880	35,398,121	1893	56,980,688
1868	16,000,090	1881	36,591,946	1894	56,977,270
1869	16,848,217	1882	36,114,814	1895	47,617,687
1870	16,218,825	1883	37,915,510	1896	48,318,790
1871	16,766,012	1884	31,660,321	1897	43,952,897
1872	17,873,696	1885	37,820,906	1898	41,809,038
1873	18,990,595	1886	39,169,304	1899	36,313,514

Sheep Returns of the Seven Colonies.

COMPARISON FOR THE YEARS 1891, 1895, AND 1899.

In 1891 the return was the largest ever known for Australasia.

Colony.	1891	1895	1899
New South Wales	61,831,416	47,617,687	36,313,514
Victoria	12,928,148	13,180,943	13,180,943
Queensland	20,289,633	19,856,959	17,552,608
South Australia	7,745,541	6,500,000	5,076,696
West Australia	1,962,212	2,295,832	2,244,888
Tasmania	1,664,218	1,523,846	1,493,638
New Zealand	18,570,752	19,138,493	19,673,725
Total Australasia	124,991,920	110,113,760	95,536,012

No return has been made up in Victoria since 1894. The figures of that year are, therefore, repeated for 1895 and 1899.

It may be of interest to mention that the latest statistics from Argentina (S.Am.) give the number of sheep in that country as 95 millions, of which about 60 millions are long-wools and crossbreds. In New South Wales the proportion of long-woolled and crossbred sheep is 8 per cent.

Telephone 38 Paddington.

NEW SOUTH WALES

Carriage & Saddlery Manufacturing Co.

193, 195 CLEVELAND STREET,

Redfern, Sydney.



**This Sulky
without Hood
£11**

These Sulkies are fitted with $1\frac{1}{4}$ 4 plate springs, $1\frac{1}{8}$ half patent axles, and $1\frac{3}{8}$ 4 ft. 4in. wheel tyres in $1\frac{1}{8}$ and $\frac{3}{8}$ tyres, painted any colour, or varnished in natural wood. Children's seats to any Sulky, 7s. 6d. Lamps, from 10s. per pair extra.

N.B.—Sulkies or Buggies made to suit smallest or largest horse, at same price.

This Splendid Bent Shaft Sulky, without hood, £11 0s 0d.

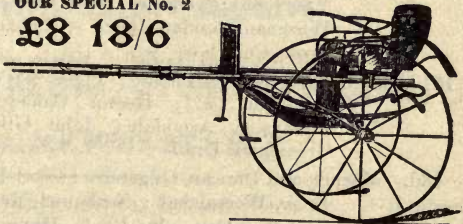
Write for our Illustrated Catalogue.

Mounted on $1\frac{1}{4}$ springs, $1\frac{1}{8}$ $\frac{1}{2}$ patent axle and 4 ft. 4in. $1\frac{3}{8}$ wheels, painted Green or Black, lined Green or Red, or Varnished in Natural Wood, trimmed in best Rubber Duck to match painting, **£8 10s 0d.**

Lamps, from 10s. per pair extra.

OUR SPECIAL No. 2

£8 18/6



This is our Special Line of Straight Shafts Sulkies No. 2.

Harness & Saddlery of every description.

Notable Prices for Wool.

Realised at Auction by Winchcombe, Carson, & Co., Ltd.

Season 1899-1900.

We particularise here those Wools which sold in our sales at 15d. and upwards for Greasy, and 24d. and upwards for Scoured.

GREASY.

Price.

Owners and District.

18½d.—H. R. F. Hume, Burrowa.

17½d.—E. H. Turner, Gunning.

17¼d.—H. R. F. Hume, Burrowa (ewes).

17d.—McMaster Bros., Bundella; H. R. F. Hume, Burrowa (w.); Chas. C. Hall, Yass.

16¾d.—P. McGrath, Burrowa; R. A. Wiseman, Bundarra; John and J. A. Love, Bookham.

16½d.—McMaster Bros., Bundella; F. and G. Manuel, Armidale; Chas. C. Hall, Yass (clo.); Andrew Davis, Yass; Prowse Bros., Adelong; R. A. Wiseman, Bundarra (com.); Richard Missen, Bendemeer; McMaster Bros., Coolah (sc. w.).

16¼d.—John Cameron, Armidale; Peter Boyton, Illabo; F. and G. Manuel, Armidale (w.); Hector Cameron, Armidale; Mrs. Kenneth Finlayson, Armidale; John Gilanders, Armidale; Austin J. Greenland, Uralla; W. T. Edwards, Bombala.

16d.—Machen and Duncan, Gilgandra; Peter Boyton, Illaboo (ewes); McMaster Bros., Weetalabah; Nathaniel Melrose, Adelong; R. H. D. Jones, Coonabarabran; H. R. F. Hume, Burrowa (culls); Joseph Tyler, Wellington; J. H. Horton, Rye Park; Henry Johnson, Armidale; R. A. Wiseman, Bundarra (2nd com.); Thos. Gallaher, Darling Downs; Hector Cameron, Armidale (e.w.); Richard Missen, Bendemeer (e.w.); P. McGrath, Burrowa (e.w.); F. J. Fahey, Burrowa; Alex. Fraser, Armidale; Furracabad Station, Glen Innes; John and J. A. Love, Bookham (h.); John Rogerson, Inverell.

REGISTERED "SQUATTER" REGISTERED
Sheep Marking Oil

BLACK, RED, BLUE AND YELLOW.

ALL DRY IN SIX HOURS NO OTHER BRANDING OILS CAN EQUAL THIS.

Without Pitch. Without Tar. Without Lead.

OR ANY OTHER INJURIOUS PROPERTY

Prepared Especially for WOOL MARKING.

Will Leave NO STAIN whatever.

Will not CRISP the Wool nor Lessen its Value.

Guaranteed ABSOLUTELY HARMLESS.

Will SCOUR CLEAN OUT of the Wool.

Made from PURE VEGETABLE OIL, and NATURAL HARMLESS COLOURS.

ALWAYS UNIFORM. READY FOR IMMEDIATE USE. STIR WELL BEFORE USING.

Put up in 5 and 10-Gallon Drums, and 4-Gallon Tins.

Samples and all Particulars from

LEWIS & WHITTY, SOLE MAKERS OF THE

"Squatter" Sheep Marking Oil,
 MELBOURNE & SYDNEY.

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J. IRELAND,
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And at NEWCASTLE.

Auction Sales of Hay, Chaff, Wheat, Bran, Pollard, Oats, &c., at Redfern Daily, and Pigs and Calves at Corporation Sale Yards, Sussex Street. Lucerne Hay, Potatoes, Onions, &c., Market Wharf.

Station Supplies, including Woopacks, Wheat Bags, Fencing Wire, Galvanised Iron, Kerosene, &c, &c., at Lowest Market Rates.

Correspondence Invited.

All Communications receive Immediate Attention.

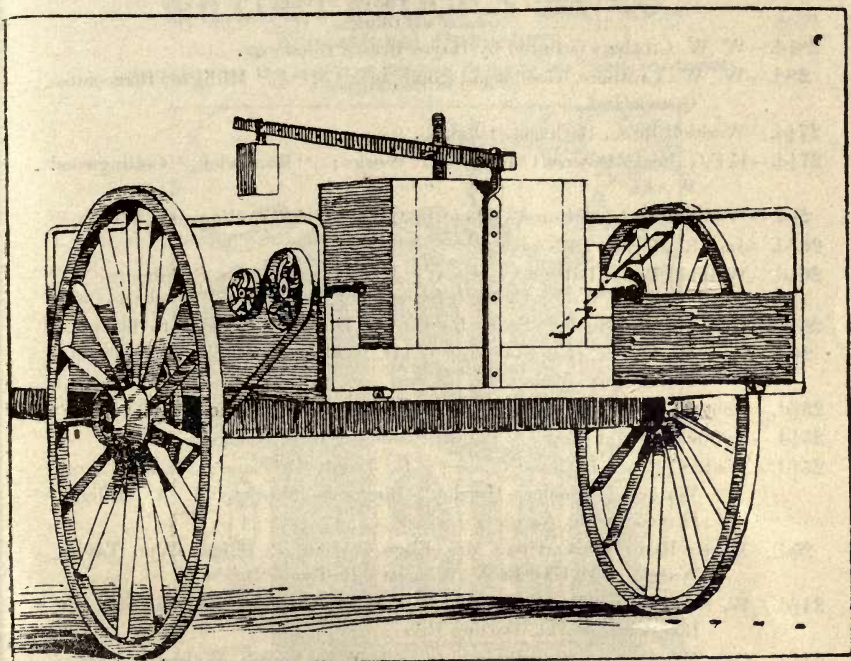
NOTABLE PRICES FOR WOOL (GREASY)—*Continued.*

Price.

Owners and District.

- 15 $\frac{3}{4}$ d.—R. and F. Giles, Gunnedah; H. Peters, Gunnedah; McMaster Bros., Coolah (see.); Fred. J. Bowhay, Molong; Chas. H. Banks, Rye Park; W. W. Crothers, Goodooga; Wm. Ross, Darling Downs; Peter Burt, Tarcutta; Alex. McClenaghan, Armidale; Wm. Rodger, Narrawa; John Wheelihan, Blandford; J. T. Cochrane, Castle Doyle.
- 15 $\frac{1}{2}$ d.—Andrew Murphy, Timor; James Williamson, Parkes; A. J. and D. E. Cox, Mudgee; McMaster Bros., Bundella (h.); John Carberry, Coolah; John Harper, Dubbo; Job Fowler, Monteagle; H. C. Holmes, Glen Innes; Geo. Hush, Braidwood; Prowse Bros., Adelong (ewes); R. A. Wiseman, Bundarra (2nd clo.); Arthur M. Rouse, Gulgong (a.); John Baker, Uralla; J. and G. McRae, Wollomombi; Steel Bros., Walcha; Isaac Spicer, Tenterden; Alex. McClenaghan, Armidale (wethers); Samuel Best, Tangmangaroo; Fred. Schrader, Walcha; John and J. A. Love, Bookham (f.); Furracabad Station, Glen Innes; Geo. Merriman, Murrumbateman (e. and w.); John Rogerson, Inverell (e.); W. T. Edwards, Bombala.
- 15 $\frac{1}{4}$ d.—Scott Bros., Dubbo; Job Fowler, Monteagle (hoggets); Joseph Hancock, Grenfell; Frank B. Osborne, Monteagle; Peter Boyton, Illaboo (h.); McMaster Bros., Bundella (see. and w.); R. H. D. Jones, Coonabarabran (2nd w.); James Morrison, Wellington; Samuel Davis, Yass; Thos. Patterson, Cumnock; R. A. Wiseman, Bundarra (necks); C. H. Barbour, Yass; Arthur M. Rouse, Gulgong (c.); John Miller, Yeoval; H. C. Holmes, Glen Innes; F. J. Fahey, Burrowa (ewes); Mrs. Kenneth Finlayson, Armidale (wethers); Samuel Best, Tangmangaroo (ewes); Daniel Tomlinson, Sofala; Wm. Sherring, Euchareena; Michael Rourke, Merriwa; John Cameron, Armidale (e. and w.); John McAllister, Armidale; Dominick Higgins, Wallangra; Furracabad Station, Glen Innes.
- 15d.—Andrew Murphy, Timor (e. and h.); Stewart M. Ryrie, Yass; Bolton and Cadell, Glen Innes; John M'Phee, Aberdeen; W. H. Teys, Goondiwindi; Mrs. Alice Sutherland, Young; B. F. Jakins, Moree; John Perks, Parkes; W. Richardson, Grenfell; H. and A. J. Price, Mudgee; McMaster Bros., Coolah (c.w., c.e.); Leslie A. Lane, Orange; Wm. Roworth, Quirindi; Wm. Harris, Warialda; W. D. Ryrie, Gunning; John Sparkes, senr., Condobolin; Fred. Sippell, Dungowan; John and Jas. A. Love, Bookham (crossbred); R. A. Wiseman, Bundarra (2 com.); W. W. Crothers, Goodooga (hog.); Arthur M. Rouse, Gulgong (broken); Joseph Douglas, Moonbi (crossbred); Casey Bros., Cassilis; S. G. Sowden, Coonabarabran; Mrs. K. Finlayson, Armidale (clo.); Peter Burt, Tarcutta (pieces); Jas. E. O'Dell, Uralla; H. C. Holmes, Glen Innes; Robt. Crossley, Bowning; C. A. Evans, Narrawa (crossbred); Donald Cameron, Wollomombi; Arthur W. Everett, Guyra; John Wheelihan, Blandford (ewes); John Cameron, Armidale (crossbred); Furracabad Station, Glen Innes (crossbred); Samuel Donaldson, Warialda; W. Rodger, Narrawa (ewes); D. McPherson, Wollomombi.

“Simplicity” Patent Pollard Distributor. FOR DESTROYING RABBITS.



THE above machine, as the name “Simplicity” implies, is a very simple one, which a lad of fifteen years, with the average intelligence, can work very easily, there being nothing complicated, consequently there is no chance of it going out of order. ©

The box to be filled with the pollard is of wood, having a double screw at the bottom, which forces the pollard forward through the nozzle, where it is cut off into pieces of whatever size may be required, by a very fine steel wire cutter. This cutter has decidedly overcome the great difficulty of the pollard clogging on the cutter, hitherto experienced by all machines, as it cuts off each and every piece free and throws it, separate and distinct, one at a time into the furrow made by the scarifier. A funnel has not been found necessary to guide the piece into the furrow, as nearly all pieces drop in or very close to the furrow, and the rabbits do not miss them. The machine is sold without the scarifier, as most stations will use the one formerly worked by them in wheat distributing, but they can be supplied if required.

This machine has been proved a great success on the stations where it has been worked.

DIRECTIONS FOR USE.—Fasten the machine on the back of a spring cart or dray, and remove one board out of the bottom under the cutter to allow the pollard to drop through; care must be taken to place the wheels in line that the band may run true on the ring. Fill the box with pollard, leaving room for the pressure plate to be put on it, and place the lever with sliding weight for adjusting pressure into position, then run the band round the ring, which is to be attached to the inside of the near wheel of the cart, and pass it under the cutter wheel and over the screw wheel; when done all is ready for use.

Price of Machine, £5 5s. Scarifier, £1 extra.

Sole Agent: A. G. Sewell, 78 Hunter Street, Sydney.

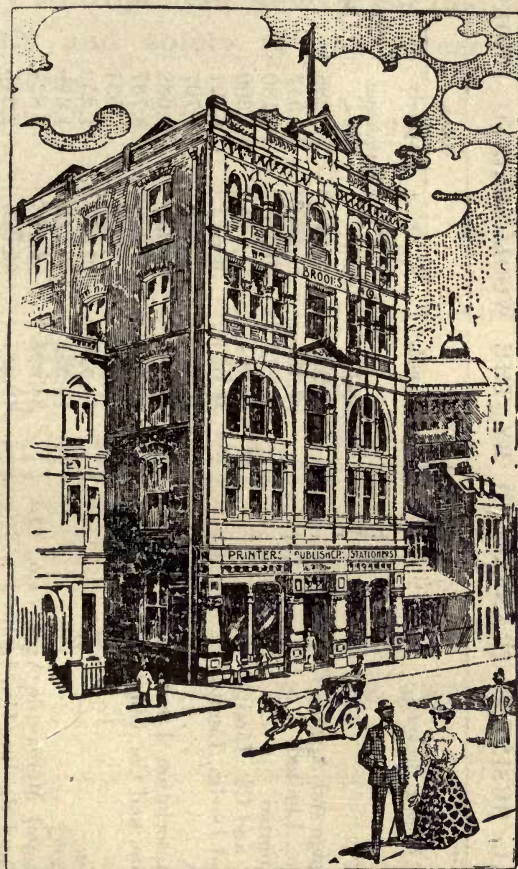
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| 28d. | —W. W. Crothers, Goodooga (combing); J. A. Milligan, Ilfracombe, Queensland. |
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| 27¼d. | —E.F.G./Peak Downs, Collingwood Works; "Randwick," Collingwood Works. |
| 27d. | —Waddell Bros., Bathurst (1st clo.); "Randwick," Collingwood Works. |
| 26¾d. | —Jno. R. Horne, Hillston. |
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| 26d. | —Geo. W. Carter, Goondiwindi; G. D. Walcott, Delegate (f.); Thomas Welsh, sen., Mungundi. |
| 25¾d. | —Robt. H. Duncan, Collingwood Works; Packer and Knox, Brisbane. |
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| 25¼d. | —Waddell Bros., Bathurst (a.a.a.); R. Trout, Brisbane; Mackay Bros., Walgett; Thomas Howlett, Boorooma Works; J. A. Milligan, Ilfracombe, Q. (pcs.). |
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| 24¼d. | —Packer and Knox, Brisbane; P. V. C. Powell, Walgett; Mackay Bros., Walgett (broken); Edwd. Bishop, Come-by-Chance (pieces); Thos. Howlett, Boorooma; Edward Fuller, Walgett. |
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TOTAL BUSINESS TRANSACTED BY THE WOOL SELLING BROKERS.

Selling Brokers.	Catalogued.	Sales.			Total Sales.
		At Auction.	Privately ex Catalogue.	Un-catalogued.	
		Bales.	Bales.	Bales.	Bales.
Australasian Mortgage and Agency Co., Limited	...	11,212	686	20	10,351
John Bridge and Co., Limited	...	57,463	41,480	4,731	51,758
Dalgety and Co., Limited	...	43,213	35,528	902	40,610
Goldsbrough, Mort, and Co., Limited	...	45,594	37,714	100	40,114
Harrison, Jones, and Devlin, Limited	...	48,023	38,873	4,801	52,938
Hill, Clark, and Co.	...	20,422	15,751	211	17,669
Pastoral Finance Association, Limited	...	41,203	31,950	6,742	42,374
Winchcombe, Carson, and Co., Limited	...	40,875	31,938	14,382	50,107
A. P. Wyly and Co.	...	3,365	1,780	1,181	3,495
J. C. Young and Co.	...	13,417	10,010	103	11,315
Pitt, Son, and Badgery	...	18,533	12,213	2,128	16,020
New Zealand Loan and Mercantile Agency Co., Ltd.	...	34,895	26,133	...	27,967
Co-operative Wool and Produce Co., Limited	...	40,887	33,003	385	35,634
Total Season 1899-1900, ending June 30	...	419,102	326,018	40,149	400,382



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The *Brisbane Telegraph* says :—"Ethel Turner's name will sell this book to those who know her ; and those who do not know her, on seeing the book, will buy it for its own sake. It is a capital book for a birthday present, a Xmas Box, or a New Year's Gift."

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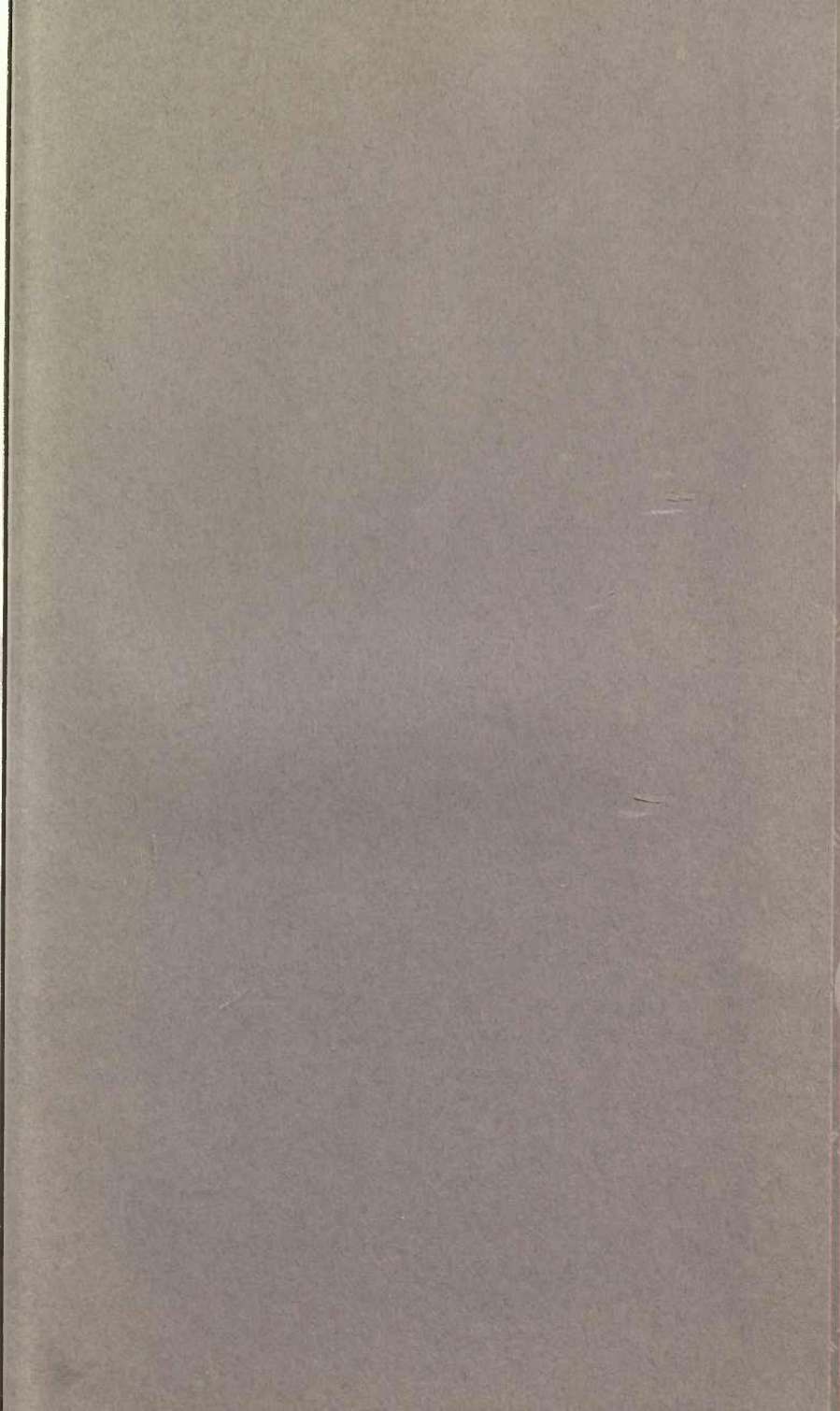
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